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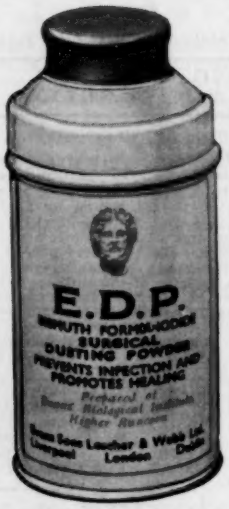

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THE TREATMENT OF PERNICIOUS ANÆMIA WITH DAKIN AND WEST'S LIVER FRACTION

(ANAHÆMIN)

BY C. C. UNGLEY, M.D. Durh., M.R.C.P. Lond.

ASSISTANT PHYSICIAN TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE; LEVERHULME RESEARCH SCHOLAR, ROYAL COLLEGE OF PHYSICIANS OF LONDON

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IN 1926 Minot and Murphy [1] reported their epoch-making discovery of the value of liver in the treatment of pernicious anæmia. The difficulty which patients who were seriously ill found in eating 250 grammes of liver daily made it desirable to prepare concentrated extracts from the whole organ. The first successful concentration of the active fraction was achieved by Cohn, Minot, and their co-workers [2] who demonstrated that the daily oral administration of a powder weighing 12 g. (fraction G derived from 400 g. of liver) was as effective for blood formation as 250 g. of whole liver.

By elaborate chemical procedures this fraction was further purified, until material injected intravenously in doses as small as 0·025 g. daily would produce a maximal regenerative effect on the blood. General use of this product was not practicable because of its high cost, resulting from the loss of large amounts of active principle during fractionation. Accordingly Castle,[3 4] using a simple solution of the fraction G of Cohn and also Gänsslen,[5] prepared inexpensive products effective when injected intramuscularly in daily amounts derived from 5 to 20 g. of liver. Given by injection the extracts were 30–100 times more potent than when given by mouth. Attempts to isolate the liver principle in a state of complete purity have been hampered by the fact that the product is easily inactivated by chemical processes and by the lack of a reliable laboratory test for activity.

Recently a further stage in the concentration of the active principle has been announced by Dakin and West.[6] For details of the complicated chemical processes involved the reader is referred to the original paper by these workers. The method employed in making the product used in the present investigation was essentially similar, fraction G (Cohn) [2] being treated with alcoholic calcium acetate to remove inactive material and subsequently concentrated by successive precipitation with ammonium sulphate, Reinecke salt, and finally ammonium sulphate again.

To this product the name Anahæmin has been given. It is a clinically potent light buff-coloured granular powder. When prepared from Cohn's fraction G a yield of 1 per cent. is obtained. The material is soluble in water and dilute alcohol, but insoluble in absolute alcohol and in ether. Dakin and West found that on hydrolysis it yielded an aminohexose and a number of amino-acids—namely, lysine, arginine, glycine, leucine, hydroxyproline and aspartic acid. Pyrimidine or purine bases were absent. The substance was slowly decomposed by pepsin and more rapidly by erepsin. Pancreatic juice had no effect upon it. Intramuscular or intravenous injections of 75 to 150 mg. have produced maximal reticulocyte responses.

A supply of anahæmin has been prepared by The British Drug Houses Ltd., under the direction of Mr. F. H. Carr, D.Sc., who originally suggested to Dakin and West the possible value of ammonium sulphate in the process of fractionation. The material was supplied in solution in ampoules containing 100 mg. per c.cm.

We were asked by the Medical Research Council to carry out the present investigation in order to determine the potency of the Dakin and West liver fraction, anahæmin, and to compare its hæmatological and clinical effects with those produced by other (less purified) concentrates. The advantages gained by simultaneous investigations at three centres were the increased number of cases obtained in a limited period and the correlation of independent observations.

It might be asked why, when potent preparations are already available, intensive research is still required into the purification of the active principle. There are at least three reasons why investigations in this direction are necessary.

(1) Increased concentration should permit the use of smaller quantities and longer periods between injections.

(2) Until the material is obtained in its pure state there is no possibility of its synthesis, a process which might lead to a marked reduction in the cost of treatment.

(3) There is the obvious desirability from the scientific point of view of investigating the influence of the pure substance not only upon blood formation, but also upon certain neurological and other phenomena associated with the syndrome of pernicious anæmia.

Progress is hampered by the scarcity of suitable cases of pernicious anæmia in relapse, and we take this opportunity of asking practitioners to refer such patients to hospital whenever possible. At the same time we acknowledge with gratitude the coöperation of those who have already permitted the investigation of patients under our care.

MATERIAL

A total of 36 cases has been treated, details of the first 23 being included in Table I. For brevity, clinical and biochemical findings other than those necessary for the present analysis are omitted, but every case was fully investigated and conformed to the criteria demanded for the diagnosis of Addisonian pernicious anæmia. In no instance was free hydrochloric acid present in the gastric juice even after histamine stimulation. Before commencing treatment a control period without therapy was observed. A diet low in meat and other sources of extrinsic factor was given during the period of investigation.

Results

CLINICAL FINDINGS

By the third to sixth day there was in most instances a feeling of well-being and a return of appetite, this subjective improvement frequently being less marked or delayed in patients with red blood-cell counts above 2 millions per c.mm.

Although in two instances soreness of the tongue persisted for more than 20 days, in most cases it had

TABLE I.—CASES AND RESULTS

No.	Case, age, sex.	Initial R.B.C. millions per c.mm.	Amount of material given. (d. = days.)	Reticulocyte response, per cent.			Increase in R.B.C. (millions per c.mm.). Days.					Arterio-sclerosis, infection, &c.	Remarks.
				Actual peak.	Day	Expected maximum.	10	20	30	40	50		
1	F. T., 53, male.	0·91	10 mg. from 0 to 9 d.; 20 from 11 to 20 d.; 300 at 31 d.	33·2 32·2	9 10	50·6 *38·0*	0·74	1·76	2·21	3·21	3·34	—	Given amm. sulphate precipitable (less purified) material from 11 to 20 days.
2	B. R., 56, male.	1·68	100 mg. at 0, 18, 36 d.	43·0	6	29·4 *18·7*	**0·39**	**0·49**	1·19	1·39	1·58	Syphilis, aortic aneurysm.	S.T. ceased. P. in fingers ceased.
3	H. M., 46, fem.	1·20	100 mg. at 0 d.; 300 at 38 d.	27·3 +	4	41·5 *29·0*	**1·86**	**2·50**	**2·50**	**2·66**	3·25	—	P. ceased.
4	A. M., 47, fem.	0·97	150 mg. at 0 d.; 400 at 20 d.	29·0 30·0 30·4	6 7 8	47·4 *34·6*	**0·86**	**1·54**	1·64	2·27	2·32	Chr. arthritis (afebrile). B.P. 152/90.	Vib. absent legs.
5	B. W., 66, male.	1·90	200 mg. at 0 and 39 d.	—	—	—	**0·38**	**1·29**	**1·76**	**1·73**	2·43	—	S.T. persisted 20 days. P. in hands much less. S.C.D. no change.
6	C. A., 75, fem.	1·13	200 mg. at 0 d.; 600 at 18, 28, 38 d., then wkly.	25·8	6	44·3 *31·7*	**0·54**	**0·61**	0·96	1·42	1·70	Subacute cholecystitis. R.A. thickened, tortuous. B.P. 175/95 (7th week).	P. below knees ceased 2nd week. Died after cholecystectomy.
7	F. C., 62, fem.	1·91	200 mg. at 0 and 28 d.	—	—	—	**0·61**	**1·22**	**1·66**	2·01	2·26	—	S.T. ceased. P. ceased.
8	P. M., 55, fem.	1·38	200 mg. at 0 and 21 d. 600 wkly. from 28 d.	28·4 28·8	6 7	36·2 *24·3*	**0·80**	**1·70**	2·14	2·74	2·88	Pyorrhœa marked.	P. to wrists and ankles ceased. S.C.D. much improved.
9	M. I., 44, fem.	1·61	200 mg. at 0 d.; 300 at 21 and 28 d.; 200 on alt. d. from 31.	17·0 +	5	31·5 *20·4*	**0·87**	**1·15**	1·82	2·32	2·67	—	P. below knees less. S.C.D. improved.
10	S. W., 72, male.	1·36	200 mg. at 0, 20, 29, 39 d.; 1000 at 49 d. Iron from 69 d.	35·4	7	36·2 *24·3*	**0·88**	**1·10**	1·43	1·95	2·38	Dental sepsis slight. R.A. thickened. B.P. 130/75.	P. to ankles ceased 10th week. Absent K.J. and A.J. Vib. doubtful.
11	E.C., 64, male.	1·82	200 mg. at 0 d.	11·0	5	27·3 *17·1*	**1·11**	**1·81**	**2·39**	—	—	—	P. in fingers much less. Slight ataxia less.
12	G. G., 63, male.	1·47	200 mg. at 0, 21, 43 d.	24·6 24·0	4 5	33·8 *22·3*	**1·30**	**1·72**	2·10	2·56	2·80	R.A. thickened. B.P. 160/70.	—
16 B	P. H., 56, fem.	1·60	300 mg.	(16·3)	(10)	—	**1·69**	**1·88**	**2·20**	**2·56**	—	See Case 16.	—
13	W. W., 68, male.	1·21	400 mg. at 0 d.	35·0	6	41·5 *29·0*	**0·91**	**1·64**	**2·18**	**2·60**	—	Dental sepsis slight. R.A. thick and tortuous. B.P. 135/65.	P. to elbows and knees Psychosis developed 5th week. S.C.D. slight, improved.
14	C. S., 35, fem.	1·31	400 mg. at 0 and 21 d., and wkly. from 30 d.	25·2	5	38·8 *26·5*	**1·10**	**1·72**	2·14	2·52	2·67	—	S.T. ceased. P. to wrists and below umbilicus decreased to finger tips and soles. S.C.D. slight improvement.
6 B	C. A., 75, fem.	1·54	600 mg.	(11·4)	—	—	**0·45**	—	—	—	—	See Case 6.	—
15	C. E., 43, male.	2·55	100 mg. at 0 d.; 600 at 11 d.; 500 at 21, 29, 36 d.	4·3 (4·2)	6 (13)	14·1 *7·5*	**0·02**	0·67	1·19	1·38	1·52	Pyorrhœa slight. R.A. thickened. B.P. 122/72.	S.T. ceased 3rd day. No true P.—" dead fingers " only.
16	P. H., 56, fem.	2·13	100 mg. at 0 d.; 300 at 19 d.	7·8 (16·3)	7 (29)	21·8 *12·9*	**0·18**	*loss*	1·16	1·42	1·71	Marked arterio-sclerosis. Cerebral vascular lesion. B.P. 220/110.	P. in fingers ceased. Old hemiplegia.
17	J. R., 62, male.	2·56	100 mg. at 0 d.; 400 at 11, 21, and 36 d.	8·0	7	14·1 *7·5*	**0·35**	0·84	1·17	1·45	1·57	Pyorrhœa. R.A. sl. thickened. B.P. 164/94.	S.T. ceased. P. to wrists and umbilicus less. S.C.D. sl. improvement.
2 B	B. R., 56, male.	2·15	100 mg.	—	—	—	**0·60**	**0·88**	—	—	—	See Case 2.	—

ceased altogether by the end of the first week. This prompt relief of sore tongue by Dakin and West's liver fraction, which from its chemical nature and mode of preparation is unlikely to contain any of the known vitamins, is interesting in view of the theories of Hutter, Middleton, and Steenbock [9] and of Groen,[10] who suggest that the tongue changes in pernicious anæmia are due to deficiency of some portion of the vitamin-B complex.

Gastro-intestinal symptoms such as epigastric discomfort, vomiting, and diarrhœa usually cleared up in the first ten days. The rapid gain in weight [11]

TABLE I.—(*continued*)

No.	Case, age, sex.	Initial R.B.C. millions per c.mm.	Amount of material given. (d. = days.)	Reticulocyte response, per cent.			Increase in R.B.C. (millions per c.mm.).					Arterio-sclerosis, infection, &c.	Remarks.
				Actual peak.	Day	Expected maximum.	Days.						
							10	20	30	40	50		
10 B	S. W., 72, male.	2·11	200 mg.	—	—	—	**0·30**	—	—	—	—	See Case 10.	—
18	R. G., 65, male.	2·21	200 mg. at 0, 19, 28, 39 d.	9·6 9·0	5 6	20·1 *11·6*	**0·45**	**0·93**	1·40	2·18	2·08	Chr. bronchitis. R.A. thickened. B.P. 150/85.	—
19	H. M., 62, fem.	2·35	200 mg. at 0 and 37 d.	—	—	—	**0·62**	**1·07**	**1·07**	**1·17**	2·15	—	—
20	R. E., 51, fem.	2·34	200 mg. at 0, 20 d. Iron at 36 d.	18·0	6	18·5 *10·5*	**0·62**	**1·14**	1·47	1·94	2·08	—	Occasional P. legs ceased. Vib. absent legs.
21	U. L., 42, fem.	2·63	300 mg. at 0 and 21 d.	3·2	6	14·1 *7·5*	**0·44**	**0·37**	0·57	—	—	Osteo-arthritis.	No P. K.J. absent. Vib. absent or diminished.
22	R. J., 34, fem.	2·12 (aver.)	300 mg. at 0 d.; 500 at 20 and 48 d.	27·8	9	21·8 *12·9*	**0·47**	**1·21**	1·33	1·81	1·91	—	S.T. severe till 22nd day. Recurred on 47th. Tingling to elbows worse at first; less after 40th. No definite S.C.D.
23	B. E., 55, fem.	2·24	100 mg. at 0 d.; 200 at 6 d.: 100 at 28 d.	3·0 3·0	9 10	20·1 *11·6*	0·95	1·76	1·83	1·58	1·36	Simple goitre.	S.T. persisted.
4 B	A. M., 47, fem.	2·51	400 mg.	—	—	—	**0·10**	**0·73**	**0·78**	—	—	See Case 4.	—
15 B	C. E., 43, male.	2·57	600 mg.	(1·2)	(2)	—	**0·64**	—	—	—	—	See Case 15.	—

Abbreviations.—R.B.C. = red blood-cells. B.P. = blood pressure (systolic and diastolic). R.A. = radial arteries. S.T. = sore tongue. P. = paræsthesiæ. S.C.D. = subacute combined degeneration. K.J. = knee-jerks. A.J. = ankle-jerks. Vib. = vibration sense. Sl. = slight. D. & W. = Dakin & West.

EXPLANATORY NOTES FOR TABLE I

"*Days*" in every instance refers to days after the commencement of treatment, the day of the initial injection being "0."

Reticulocytes.—Where the summit of the response was a "plateau" rather than a "peak," counts closely approximating to the maximum are given. The + sign in Cases 3 and 9 indicates that the actual maximum was probably higher than the recorded figures, the reticulocyte count not having been made daily in these two instances. The expected maxima are those calculated by Bethell and Goldhamer [7] for intravenous injection of liver extract. Actual calculations for intramuscular injection are not yet available. The expected maxima for oral liver therapy (Riddle [8]) are given in italics.

Red blood-cell increases attributable to the injection of a single dose are printed in heavy type. At the time of the second injection in Cases 2, 4, 6, 10, 15, and 16 the red blood-cell increase following the first dose had ceased and the erythrocyte level remained below 3 millions per c.mm. These cases are included in the table for a second time (e.g., as Case 2 B) in order to show the rate of red blood-cell increase produced by the second dose. Secondary reticulocyte responses produced by second doses of material are given in parentheses (e.g., in Cases 16 and 16 B).

A column is included for "arterio-sclerosis and infection," since these factors have been shown to influence the response to treatment.

Under the heading "Remarks" the presence and the effect of treatment upon sore tongue, paræsthesiæ, and neurological phenomena are recorded. When not specifically mentioned such manifestations were absent. Further details of the neurological findings are given later in this paper under "Discussion."

Order of cases.—The cases have been divided into two groups: those with initial red blood-cells below 2 millions and those with initial counts at this level or above it. In each group the cases are arranged according to the amount of Dakin and West's fraction given in the first 10 days. Cases receiving similar amounts of material are put in order of 10 day increase of red blood-cells.

Sheffield cases: 5, 11, 19, and 2 others.
Aberdeen cases: 2, 3, 7, 9, 16, 20, 21, 23, and 6 others.
Newcastle cases: 1, 4, 6, 8, 10, 12, 13, 14, 15, 17, 18, 22, and 5 others.

The initial dose in Cases 8 and 10 and the first two doses in Cases 12 and 18 were given intravenously, but all other injections were made intramuscularly.

REACTIONS

When a second intravenous injection was given Case 18 suffered from pains in the limbs and back, flushing, and intense dyspnœa as if from bronchospasm. The symptoms ceased within half an hour of the injection. Under similar circumstances Case 12 had merely a flushing of the skin. Except for an occasional rise of temperature to 99° F. no other reactions were observed.

which frequently accompanies a remission, however induced, was observed in this series also.

Transient paræsthesiæ often brought on by exposure to cold and sometimes associated with obvious circulatory disturbances in the extremities—e.g., "dead fingers"—passed off within the first two weeks. More constant numbness and tingling, probably nervous in origin, decreased in extent and intensity after a variable period in every instance (see Table I.).

Objective neurological findings were observed in 12 instances. Cases 4, 10, 20, 21, and 22 showed merely diminished or absent vibration sense with or without depression or absence of deep reflexes; except for minor alterations in reflexes no significant changes were observed.

The effect of treatment in Cases 11, 13, and 17 showing evidence of subacute combined degeneration, but of relatively slight degree, is sufficiently indicated in Table I.

There were four patients with moderately severe subacute combined degeneration of the cord. Case 5 had less numbness and tingling, but showed no change in objective findings after 50 days, having received only 400 mg. in that time. In Case 14 paræsthesiæ diminished and gait improved, but at the sixty-sixth day the physical signs were little changed. Although still ataxic a patient (Case 9) who was unable even to stand can now walk for short distances without help. Spasticity has decreased but the plantar reflexes remain extensor. Incoördination and loss of cutaneous sensibility are less. Case 8 was remarkable in that after ten weeks the patient was free from paræsthesiæ, cramps, incontinence of urine, and dysfunction of the hands. The memory had become normal. The gait became quite steady and she was even able to run. Romberg's sign was negative. The plantar responses which until the eighth week had been clearly extensor thereafter became flexor in type. Depressed deep reflexes were more readily obtainable. Vibration sense returned in the spine, pelvis, and lower extremities with the exception of the toes, and cutaneous sensibility in the feet improved.

The fact that symptoms and signs of subacute combined degeneration improved during treatment with such a highly purified liver fraction is of considerable theoretical interest. Should the results be confirmed in a larger series of cases it will show that the hypothetical cord factor, if not actually identical with the hæmopoietic liver principle, must at least be allied to it chemically.

RETICULOCYTES

Up to a point, the height of the reticulocyte peak after the administration of any active substance increases with the quantity of material administered, but for a given initial red blood-cell count there is a maximum reticulocyte response which is rarely exceeded however great the amount given. The smallest quantity of material required to produce such maximal responses has been used as a measure of potency,[12] a matter to which further reference will be made. Table II. indicates the degree of reticulocyte response which followed the administration of varying amounts of Dakin and West's liver fraction anahæmin, figures for commercial liver extracts and for Dakin and West's own series being included for comparison. The reticulocyte response is described as good, moderate, or poor. Standard reticulocyte responses for the intramuscular route which was used in most instances are not available, but judging from published data[12] it seems that the maxima usually fall somewhere between those for intravenous and those for oral therapy. An arbitrary line midway between the maxima for intravenous [7] and for oral liver therapy [8] has therefore been chosen, "good" responses being those which reached or exceeded this level. "Poor" responses are those which fall below an arbitrary level three-fourths of the maximum for oral therapy. "Moderate" refers to peaks falling between the two levels mentioned.

TABLE II

Reticulocyte responses according to dose

—	No. of cases.	Good.	Moderate.	Poor.
150 mg. or less ..	8	1 (12·5)	4 (50)	3 (37·5)
200 mg.	8	2 (25)	5 (62·5)	1 (12·5)
300 or 400 mg. ..	4	2	1	1
Total for present series	20	5 (25)	10 (50)	5 (25)
Campolon 10 c.cm. or Pernæmon Forte 10 c.cm. (Ungley) ..	9	4 (44·4)	4 (44·4)	1 (11·1)
Campolon, Hepatex, or Lilly Ext. 2 to 5 c.cm. daily (Davidson) ..	6	3	1	2
Total	15	7 (46·7)	5 (33·3)	3 (20)
Dakin and West's series (75 to 150 mg.) ..	16	10 (62·5)	5 (31·25)	1 (6·25)

Percentages are given in parentheses.

A comparison with the figures for massive doses of commercial liver extracts shows that the percentage of "good" reticulocyte responses to 2 c.cm. of anahæmin (100 mg. per c.cm.) is lower than that produced by single injections of 10 c.cm. of Campolon or Pernæmon Forte, or daily injections of Campolon, Hepatex, or Lilly's extract (see Table II.). There are not sufficient data available for doses in excess of 200 mg. The reticulocyte responses obtained by Dakin and West [6] are referred to later.

INCREASE OF RED BLOOD-CELLS

It is well recognised that cases with a high initial red blood-cell count show a smaller rate of increase in erythrocytes than cases with a low initial level. An analysis of our data shows that this reduced rate of blood production is as apparent in cases starting with a high initial count as in cases which have reached a high level consequent upon previous treatment. When assessing the rate of red blood-cell increase in a given period produced by differing kinds or amounts of material, it is therefore desirable to confine comparison to cases with approximately similar initial levels. An idea of the rate of increase to be expected from adequate therapy may be gained by reference to Table III. which shows the response to oral and parenteral liver therapy in other series of cases. The initial level of red blood-cells in cases receiving anahæmin (1·55 to 1·57) was somewhat higher than in those receiving other liver extracts (1·2 to 1·37). Such a small difference in initial level can only have a slight effect on the rate of increase in 10 to 20 days (see Bethell's [14] paper, Fig. 5). Details of the effects produced by varying doses of the Dakin and West fraction are given in Table I. Doses amounting to 150 mg. or less in the first 10 days were given in four cases having initial red blood-cell counts below 2 millions. There was an extremely rapid increase of red blood-cells in Case 3, a moderate increase in Cases 1 and 4, and a poor response in Case 2. Cases 15, 16, and 17 with initial counts over 2 millions showed very little response and Case 2B showed a

moderate response. The results are too variable and too few for purposes of comparison or statistical treatment.

Eight cases (Nos. 5 to 12) with initial red blood-cell counts below 2 millions received 2 c.cm. of anahæmin (100 mg. per c.cm.) as a single dose. The rise of red blood-cells was variable, lasting as a rule for from two to three weeks. On the average the increases in 10 and 20 days were similar to those produced by the administration of large amounts of

TABLE III

Comparison of rates of increase of red blood-cells in cases of pernicious anæmia having initial counts of 2 millions per c.mm. or less

Preparation.	Dosage.	Average initial R.B.C.	Average increase in R.B.C.				(*a*) Average count at 40 days. (*b*) Time to reach 4 millions
			10 days	20 days	30 days	40 days	
(a) *Single Injection*							
(I.) D. & W. fraction (B.D.H.): 8 cases.	200 mg. (2 c.cm.)	1·57	0·81	1·36	—	—	—
(II.) Campolon or Pernæmon Forte: 8 cases (Ungley).	10 c.cm.†	1·37	1·1	2·05	—	—	—
(b) *Divided Doses*							
(III.) D. & W. fraction (B.D.H.): 11 cases receiving not more than 600 mg. in 5 weeks.	359 mg. (aver.) in 5 wks.	1·55	0·96	1·54	1·84	2·31	(*a*) 3·86. (*b*) 6 wks.
(IV.) Campolon: 12 cases (Davidson).	30 to 82 c.cm. in 5 wks.	1·35	0·78	1·47	2·11	2·46	(*a*) 3·81
(V.) Liver extract intravenously: 79 cases (Bethell [14]).*	10 to 20 c.cm. per wk.	1·3 app.	0·86	1·68	2·42	2·89 +35 days	(*a*) 4·19 +35 days. (*b*) 5 wks.
(c) *Daily Oral Administration.*							
(VI.) Ext. 343: 24 cases (Minot, Cohn, Murphy, and Lawson [13]).	Ext. from 500–600 g. daily.	1·20	0·85	1·90	2·61	—	—
(VII.) Ext. 343: 9 cases (Minot, Cohn, Murphy, and Lawson [13]).	Ext. from 250 g. +daily.	1·35	0·46	1·25	1·98	—	—

* The figures for R.B.C. increase are approximate, having been calculated from charts in Bethell's paper.
† Containing from 2500 to 3500 mg. of solid matter.
app. = approximate.

campolon in divided doses (Table III., Series I. and IV.) but were less than those which followed the single injection of 10 c.cm. of campolon or pernæmon forte containing from 2500 to 3500 mg. of solid matter * (Table III., Series I. and II.). The difficulty of assessing the potency of preparations is well exemplified in Table III., Series II. and IV. The 12 cases in Series IV. received from 20 to 30 c.cm. of campolon during the first week. The average gain in red cells in 20 days is less than that which followed the single injection of 10 c.cm. This cannot be explained as being caused by the effect of a single injection, nor on the grounds of differences in the initial red cell level, but only on fortuitous circumstances by which in series II. a number of cases happened to be included which show a high grade of response. The average gain in 10 and 20 days in series IV. is of the same magnitude as occurs in series I., III., and V. The contention that series II. was fortunate in containing cases showing a high grade of response is supported by the fact that the rates of increase are higher than those shown by the large number of cases in series V., receiving optimal amounts of liver extract intravenously.

The increase of red blood-cells in 20 days is distinctly less than that which follows the daily administration of extract 343 (fraction G of Cohn) derived from 500 or 600 g. of liver, and slightly exceeds that which is to be expected after the daily oral administration of extract 343 from 250 g. of liver [13] (see Table III.). It may be concluded that the optimal single dose for rapid production of red blood-cells in 10 and 20 day periods is in excess of 200 mg.

Two out of three cases receiving 300 mg. at an initial red blood-cell count of over 2 millions (Nos. 21, 22, 23) had a greater increase at 20 days than the three cases with a similar initial level receiving 200 mg., but Case 4 B receiving 400 mg. from a red blood-cell level of 2·51 millions showed a poor response. Only three cases (Nos. 16 B, 13, and 14) had 300 or 400 mg. at an initial red blood-cell level sufficiently low for adequate test, and all three gave a good response. The data for doses of 300 and 400 mg. are not sufficient however to indicate whether in the average case such initial amounts are likely to be optimal for the production of red blood-cells at a maximal rate.

On the other hand, there were 11 patients with initial red blood-cell counts below 2 millions per c.mm. who received 100 to 600 mg. (average 359 mg.) in a period of 36 to 40 days. Cases with various initial red blood-cell counts below 2 millions receiving similar amounts of material tend to have much the same level after five weeks.[14] It is significant therefore that not only are the rates of increase in this series of the same magnitude as those produced by large doses of campolon, but the final counts after 40 days are almost identical (Table III., Series III. and IV.). (It would of course be incorrect to conclude that 1 to 6 c.cm. of anahæmin were quantitatively equivalent to 30 to 82 c.cm. of campolon, because these quantities of campolon may have been more than were required to produce the effect attained.) Bethell's [14] 79 cases receiving a regular weekly intravenous injection of 10 to 20 c.cm. of liver extract showed a considerably greater gain in 35 days than either of these series (Table III., Series V.).

Figures for red blood-cell increase are available in only 3 of the 20 cases reported by Dakin and West,[6] but it is noteworthy that in their series 75 to 150 mg. were usually followed by a maximal reticulocyte response. It would appear possible that the material used in the present investigation may be somewhat less active than that prepared by Dakin himself. Dr. Dakin suggests [15] as a possibility that when fresh liver is used instead of extract as starting material there may be less "denaturing" and increased activity.

The difficulty in drawing conclusions as to the potency of a product from hæmatological observations in small groups of patients must be fully realised. When reticulocyte counts are made only once daily it is unlikely that the maximum percentage attained will be observed in every instance.[7] When, as in the present investigation highly purified materials are given and the intramuscular route is used, the irritant effects which may arise from non-specific substances present in material administered intravenously are likely to be less marked. But while we admit that in the majority of cases a maximal reticulocyte rise is followed by an excellent increase in red cells and a poor reticulocyte rise by little or no gain in red blood-cells, a study of Table I. clearly

* Recent batches of Pernæmon Forte differ from those used in Series II. in containing a smaller proportion of solid matter.

indicates that exceptions to this rule may occur. Thus while Case 2 showed a good reticulocyte response and little increase in red blood-cells, Case 11 had a poor reticulocyte response followed by a good gain in red blood-cells. In Cases 13 and 14 the patient with the smaller reticulocyte response had a more rapid increase in erythrocytes. A study of Table I. shows marked variations in reticulocyte response and red blood-cell gains in patients at similar initial levels receiving similar amounts of material. These variations may be quite independent of factors such as arterio-sclerosis and infection. This is well exemplified by the differences in reticulocyte response observed in Cases 13 and 14, 15 and 17, 21 and 22, differences for which no adequate explanation is forthcoming. Incidentally although we agree that in general cases with marked arterio-sclerosis or sepsis do badly (see Case 6) this does not hold good in every instance (see Cases 16 B and 13). A striking example of an optimal response in the presence of very severe sepsis has been published by one of us.[16]

It might be expected that age would influence the degree of response. Nevertheless analysis of the reticulocyte response and rate of red blood-cell increase in cases receiving Dakin and West's liver fraction showed no difference between those under and over 60 years of age. For this reason, although the age-incidence was higher in eight cases receiving 200 mg. of Dakin and West's liver fraction than in those receiving 10 c.cm. of campolon or pernæmon forte, the fact does not appear to account for the difference in response in the two series.

Since this investigation was commenced Strandell[17] has reported the isolation of an almost colourless liver fraction; 2 mg. dissolved in water and injected intragluteally in patients with pernicious anæmia produced a marked hæmopoietic effect. The method of preparation has not yet been published.

Summary and Conclusions

A total of 36 cases of pernicious anæmia have been treated with Dakin and West's liver fraction, anahæmin. The material has been compared with other liver preparations in respect to the production of reticulocyte responses, increase of red blood-cells, and clinical improvement.

The data submitted emphasise the difficulty of assessing potency upon reticulocyte responses and red blood-cell increase in tests limited to a small number of cases. The results indicate, nevertheless, that anahæmin, as prepared by the British Drug Houses Ltd., is highly active for blood regeneration in pernicious anæmia. Total quantities of 1 to 6 c.cm. (100 to 600 mg., average amount 359 mg.) administered usually in divided doses, to 11 cases with initial red blood-cell counts below 2 millions per c.mm., were sufficient to cause an average increase of erythrocyte concentration amounting to 2·31 millions in 40 days. Good responses followed the administration of amounts sometimes as small as 10 mg. daily or 100–200 mg. as a single dose. For maximal reticulocyte responses, and for the production of red blood-cells at a maximal rate, larger doses were usually required. There is not sufficient data to assess quantitatively the potency of anahæmin as compared with other liver extracts, but in our experience no other liver extract given in the small amounts used in this investigation has produced such striking results. Preliminary observations suggest that this highly purified fraction may prove to be at least as potent as other liver extracts[18] in the treatment of the neurological manifestations of pernicious anæmia.

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NOTE ON THE ANTI-ANÆMIC PRINCIPLE OF LIVER

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MUCH work has been carried out during the last few years in attempts to isolate and elucidate the nature of the principle present in liver that is responsible for initiating remissions in patients with pernicious anæmia. So far the identity of this liver principle remains obscure, although many concentrated highly purified extracts have been prepared. The slow progress has been due partly to the fact that every fraction can only be tested clinically on approved adequately controlled cases of pernicious anæmia,[1] and partly to the nature of the liver principle itself, which is extremely readily destroyed by many solvents and mild reagents—the more highly purified fractions being particularly sensitive.

In consequence of this sensitivity it has been difficult to standardise preparative methods of fractionation that would guarantee hæmopoietically active products every time. However, with the assistance and coöperation of Dr. F. L. Pyman, F.R.S., of the Boots Pure Drug Company Limited, Nottingham, I have been able to make considerable advances in this connexion.

A few months ago Dakin and West[2] described a method using Reinecke acid whereby they obtained a product of which 80 mg. was capable of producing maximal reticulocyte responses in patients with

pernicious anæmia. This was an important addition to our knowledge of the properties of the liver principle and I therefore attempted to repeat it.

Several difficulties were encountered resulting in the first few experiments yielding inactive products. These having been circumvented, however, successful products can now be prepared satisfactorily and I have been able to confirm Dakin's claim.

All the fractions have been examined clinically by the method already described [1]—that is to say, each test case of pernicious anæmia was a typical uncomplicated one in relapse without having had treatment previously to complicate the picture. In every case a control period of 7–21 days was noted and the reticulocytes remained within normal limits. (These data are omitted from the Tables.) In each case reported in this paper no further subsequent reticulocyte response was obtained after those tabulated, which indicates that they were maximal responses. Table I. shows results from our experimental series W.D. 8 and W.D. 9, selected to illustrate the repetition of Dakin's method. It will be seen that maximal reticulocyte responses have been obtained with doses of 58–120 mg. of these fractions when given intramuscularly. Thus my results confirm the claims of Dakin and West that Reinecke acid can be used further to purify the anti-anæmic liver principle, but a good deal of active material is lost during the various stages of these chemical manipulations.

TABLE I

Reticulocyte Response to Extracts prepared by Dakin and West's Method

Fraction and Case No.	Total dose.	Equiv. fresh liver.	Day of treatment.	Retics. (per cent.).	R.B.C.	Hb. (per cent.).
	mg.	g.				
W.D. 8 (PA/A/43).	90	150	1	0·5	990,000	26
			3	0·5	—	—
			6	23·8	—	—
			7	39·8	960,000	26
			12	6·0	1,630,000	39
			19	2·5	2,110,000	42
W.D. 8 (PA/512).	120	200	1	1·9	1,190,000	40
			4	7·0	—	—
			6	39·7	1,610,000	42
W.D. 8 (PA/628).	120	200	1	1·8	1,310,000	34
			5	6·4	—	—
			7	12·0	1,410,000	40
			8	30·0	—	—
			13	4·0	2,210,000	58
			23	0·7	3,500,000	70
W.D. 9 (PA/622).	58	100	1	1·5	1,150,000	28
			4	5·8	—	—
			5	17·2	—	—
			7	40·2	1,480,000	42
			9	25·0	—	—
			14	6·8	2,160,000	54
			21	2·5	2,540,000	64
			35	0·5	3,040,000	74
W.D. 9 (PA/623).	116	200	1	0·6	1,216,000	35
			4	3·4	—	—
			6	36·2	1,304,000	39
			8	20·2	—	—
			11	3·6	1,950,000	52
W.D. 9 (PA/631).	87	150	1	1·4	1,380,000	40
			4	5·4	—	—
			6	24·7	1,020,000	28
			7	31·6	—	—
			16	1·9	2,200,000	58

R.B.C. = red blood-cells. Hb. = hæmoglobin.

While these experiments were in progress Strandell [3] reported good hæmopoietic responses using specially fractionated liver products (details of which have not yet been published), and claimed maximal responses with doses of only 0·002 g. He kindly sent me some of his unpublished results in connexion with this, and at the same time an experimental quantity of a highly purified liver fraction (N.S.G.L.1) similar to those he had been using was obtained by and made available to me through Mr. Bacharach of Glaxo Limited; this also has been examined clinically. It will be seen that responses were obtained using doses of 4–8 c.cm. when administered intramuscularly; each cubic centimetre of this solution contained 10 mg. of total solid so that the dosages used were 40–80 mg. (Table II.).

TABLE II

Response to Strandell's Extract

Fraction and Case No.	Total dose.	Day of treatment.	Retics. (per cent.).	R.B.C.	Hb. (per cent.).
	mg.				
N.S.G.L. 1 (PA/607).	80	1	1·0	910,000	27
		4	5·4	952,000	28
		9	33·0	—	—
		11	19·8	1,824,000	46
		18	2·2	2,280,000	56
N.S.G.L. 1 (PA/598).	60	1	2·6	1,680,000	44
		5	3·9	—	—
		7	9·3	1,950,000	50
		8	18·8	—	—
		14	2·3	2,560,000	62
N.S.G.L. 1 (PA/609).	40	1	3·5	1,750,000	54
		5	10·1	—	—
		7	14·9	—	—
		8	7·3	1,910,000	60
		15	1·0	2,670,000	68
		22	1·6	3,360,000	76
		27	0·7	3,800,000	78

Having successfully repeated the Reinecke acid method of fractionation several times, I have now introduced it as a step in our methods of fractionation. This has been done by (1) carrying out the Reinecke acid separation first and then subjecting the product to further fractionation, and (2) by applying the Reinecke acid separation to the products obtained by our own methods. Again these have been carried out on a sufficiently large scale by Dr. Pyman so that adequate supplies have been available for trial.

In series W.D.7, shown in Table III., it will be seen clearly that the potency of the final product has been greatly increased, since maximal responses have been obtained consistently with total doses of only 18–36 mg. representing an original amount of 666–1332 g. of fresh liver. The product thus obtained was colourless and was administered in aqueous solution. Further fractionation is in progress and I hope at a later date to report fuller details.

TABLE III

Response to Author's Extract

Fraction and Case No.	Total dose.	Equiv. fresh liver.	Day of treatment.	Retics. (per cent.).	R.B.C.	Hb. (per cent.).
	mg.	g.				
W.D. 7 (PA/512).	36	1332	1	2·8	1,340,000	36
			4	5·3	—	—
			5	28·8	—	—
			7	40·0	—	—
			11	5·8	2,350,000	52
			18	2·5	2,730,000	57
W.D. 7 (PA/629).	27	999	1	0·5	1,320,000	36
			5	4·0	—	—
			7	29·0	1,850,000	48
			9	20·0	—	—
			14	2·0	2,190,000	58
W.D. 7 (PA/A/51).	18	666	1	1·4	960,000	28
			3	2·5	—	—
			5	12·0	—	—
			7	32·0	1,500,000	34
			14	5·8	2,150,000	40

SUMMARY

The fractionation of liver extracts containing the anti-pernicious anæmia principle by means of Reinecke

acid to yield a more highly potent fraction has been confirmed. Using this method products have been obtained of which 58 mg. produced a maximal reticulocyte response and a rapid remission in a patient with pernicious anæmia. Applying this method to other methods of separation a further increase in hæmopoietic potency has been secured so that as little as 18 mg. of the product have been sufficient to initiate a maximal reticulocyte response and rapid remissions in pernicious anæmia.

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THE PROGNOSIS AFTER INFARCT OF THE HEART

A CLINICAL STUDY

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THE dramatic symptoms which sometimes occur when a coronary artery becomes blocked, and the not infrequent sudden termination of life, have led to a pessimistic outlook in these cases. But pathological experience has shown that cardiac infarcts are not necessarily immediately fatal, and that recovery may ensue. In Moritz and Beck's [1] series of 94 cases in which a main coronary artery had been occluded only 14 died after the first block. Accumulating clinical experience points in the same direction. Parkinson and Bedford [2] state that if the patient is alive when seen after the occurrence of an infarct recovery is more likely than death. Reasonable health may be maintained subsequently even for many years. Cases have been reported where the patient lived for seven,[3] eleven,[2] thirteen,[4] fourteen,[5] seventeen,[6] and twenty [7] years.

Abrupt closure of a healthy main coronary artery causes sudden death, but if the closure is gradual anastomotic developments may take place in the neighbouring arteries and prevent serious results. Clifford Allbutt [8] examined a heart where the orifices of the coronary arteries were so utterly obliterated that their very site was indefinable, and yet the myocardium was normal. Leary and Wearn [9] report a case in which the orifices were almost completely closed and the muscle normal; and another case where the right coronary artery was blocked and the orifice of the left artery greatly narrowed, yet again with normal cardiac muscle. We have examined the heart of a man, aged 73, whose right coronary artery was occluded for about an inch, immediately after its origin, the only result being a small area of ischæmic fibrosis, not due to infarct, near the base of the right ventricle.

As a rule block takes place in a coronary branch and not in a main trunk, and the possibilities of satisfactory anastomotic developments are greater than if a main artery is affected. It seems that infarct is rarely due to closure of a single vessel. Saphir and his colleagues,[10] examining with meticulous care 30 cases of infarct, failed to find a single case in which but one artery was affected. Two might be completely closed, or one blocked and the neighbouring arteries grossly narrowed. Multiple lesions are necessary to produce an infarct.

The size of infarcts varies. They may be large or small. The gross lesions, affecting large areas of the myocardium, were those which first attracted clinical attention, but we are now recognising the lesser lesions. In the gross lesions the early symptoms are severe and persist for some time. In the lesser lesions the early symptoms may be severe but of short duration, or of comparatively mild type. Thoracic pain is not invariably present. Pain may be referred to the abdomen or wholly absent. Sudden cardiac collapse or an attack of dyspnœa may be the only sign of infarct.

The prognosis in cases of cardiac infarct is difficult to assess. Sudden death, without warning, may be the sole clinical sign of a coronary block. In the major attacks half the patients die at the outset, or within the next month. Of those who survive some never regain health, and die of progressive cardiac failure after a variable period. Others regain their health and live, even for many years, in fair comfort. There is little available information regarding the ultimate issue in the last groups, so we have examined the clinical records of 66 patients, 58 men and 8 women, who had had an infarct of the heart and survived for more than six months afterwards. This period was chosen as we are concerned with the late results of infarct, and recovery is rarely definite before six months have elapsed. The records are necessarily incomplete for 33 of the patients are still alive. Forty-four patients have lived for more than two years, one of them for ten and another for fourteen years. Thirty-eight resumed their work, which, however, as one would anticipate from their age, was never manual and could usually be regulated according to their physical needs.

Thirty-three patients are still alive, more than six months after an infarct. One patient whose infarct occurred *nine months* ago has never regained health. He has had several strokes and has uræmic symptoms.

TABLE I

Showing the present health of those patients who are still alive

Duration of life after an infarct.	Health			
	Good.	Fair.	Poor.	Total cases.
Less than one year ..	—	—	1	1
More than one year ..	3	4	1	8
,, two years ..	3	1	—	4
,, three ,, ..	4	3	—	8*
,, four ,, ..	2	1	—	3
,, five ,, ..	3	3	2	8
,, six ,, ..	1	—	—	1
—	16	12	4	33

* 1 unknown.

Eight patients have survived for more than *one* year. One of them has recently had a recurrence of cardiac symptoms. Four are in fair health for their years, and lead a quiet life without discomfort. Three are in good health, two in active work. One rides quietly and shoots driven birds. Another is paying visits in the U.S.A. Four have lived for more than *two* years. Three are in good health and lead their usual life, which in one case is very active. The fourth is in fair health, but resents his necessary abstention from golf. Eight have survived for more

than *three* years. Four, in reasonable health, are still at work. One has benefited by removal of gall-stones. Three are in reasonable health but have retired from business. The other is still alive, but as he has left the district his activity is unknown. Three patients have survived for *four* years. Two are leading active lives. The third, who is in fair health, has retired from business. Eight patients are alive *five* years after an infarct. One has had a recurrence of cardiac symptoms recently, and is forced to lead a quiet life. Another has never recovered his health. He has had a stroke, and a foot removed for gangrene; the other foot is now affected. Three are in fair health, leading a quiet life. Three are active in business, two of them playing golf as well as ever, though their standard may not be high. One patient is still alive after *six* years and works hard at his business.

Sixteen of these patients resumed their ordinary occupations after an infarct. Twelve are in fair health. The health of the remaining four is poor.

Thirty-three patients have now died. Seven died *within a year* of the first attack. Five of them never regained tolerable health, but two returned to work, one dying when shaving, the other in his garage. Six patients died in the *second* year. Three never regained tolerable health, but three resumed their ordinary avocations. Five patients died in the *third* year. One was never well and died from uræmia. The other four resumed their usual habits, two of them undertaking arduous work. Three died in the *fourth* year. Two were never really well. The third continued at work until the onset of a pulmonary tumour. Three died in the *fifth* year. All resumed their work. One died without warning in his sleep, one from a stroke, the third from pneumonia. Four died in the *sixth* year. All resumed their work. One patient died in the *seventh* year, having continued at work fairly steadily in the interval. He died in the bathroom within a few minutes. One died in the *eighth* year, after nearly five years of strenuous work. One died in the *ninth* year. He worked hard for many years and played golf. He died in his sleep some months after a successful operation for gall-stones. One patient lived for *ten* years after his first attack, and for five after the second. A third attack proved fatal. One patient recovered from his first attack and worked hard for the next five years, subsequently taking life easily. He had a slight recurrence of cardiac symptoms nine years after the first. He died slowly from cerebral softening *fourteen* years after the initial symptoms.

Twenty-two of these patients resumed their ordinary avocations for a time after an infarct. In at least ten cases the work was arduous. Several played golf, shot, climbed hills, &c., without difficulty.

Patients who have had a cardiac infarct do not always die from cardiac failure. In Parkinson and Bedford's[2] series 21 of 83 cases, examined post mortem, died from other than cardiac causes. In this series 24 patients died from cardiac failure, 14 slowly and 10 suddenly. But 2 patients died from strokes; 2 from embolism, of a cerebral and of a femoral artery; 2 from tumour; 1 from pneumonia; 1 from senile decay. The cause of death of the other patient could not be ascertained.

The occurrence of a cardiac infarct may be merely a phase of a general disease. One patient had a stroke in 1921, a cardiac infarct in 1922, and a second, fatal, stroke in 1925. He had no cardiac symptoms save at the time of the infarct. A lady complained of intermittent claudication in 1930, had a cardiac infarct in 1931, a right hemianopia in 1932, and a second, fatal, cardiac infarct in 1933. Another patient, who is still alive, has never been well since his infarct in 1932. He has had a stroke, and one foot had to be amputated on account of senile gangrene in 1934. The other foot is now affected.

In some patients disease in organs other than the heart complicates the picture and the outlook. One patient suffered from cholecystitis in the spring of 1930 and from a cardiac infarct in the autumn; in 1931 from jaundice; in 1932 from cardiac, hepatic, and cerebral symptoms, the latter probably due to embolism; in 1933 and 1934 from recurrences of his hepatic symptoms, which necessitated the removal of gall-stones in July, 1934; in January, 1935, from convulsions. He is now in better health than for many years, and active at business. Gall-stones are not uncommon in this group of cardiac disease. Operative interference is, as a rule, badly borne, but we have seen several patients who were benefited. Renal and diabetic symptoms may coincide, and occasionally dominate the outlook. One patient, who is not included in this series, was admitted into hospital on account of uræmic symptoms of some months' duration. He died in coma. Post-mortem examination revealed cirrhotic kidneys and a greatly enlarged heart, with aneurysm of the anterior wall of the left ventricle. Three weeks before his death his systolic blood pressure was 160 mm. Hg. There was a minimal œdema of his feet on admission, but it soon disappeared and did not recur, so the sole evidence of cardiac insufficiency lay in the presence of symptoms of renal inadequacy.

In the presence of symptoms of cardiac insufficiency the prognosis must be based upon the symptoms as they emerge, day by day, as in cases of cardiac weakness due to other causes. In cases where recovery has ensued after a cardiac infarct the prognosis must be based upon all the data that are procurable, always remembering that sudden death is not uncommon in these patients and may occur without warning. An old gentleman, who had had a cardiac infarct five years previously from which he had made a good recovery, completed his usual day's work, took his dogs for an airing, and went to bed, where he was found lying dead in the morning. Another patient, whose infarct had occurred eight years previously, who had had gall-stones removed some months before, was met casually one afternoon. He told us that he was very well and resuming his work gradually. After dinner he played a game of cards and went to bed. He died in his sleep.

In this series nine patients are alive more than six and less than twenty-four months after an infarct. Two are active at work and straining at the leash; five are in fair, and two in poor, health. As the issue in this group is still uncertain we have omitted them from our figures. Prolongation of life for two years or more seems to indicate that the original lesion has healed, and that danger lies in the underlying pathological state rather than in the past infarct; in the possibility of the occurrence of a fresh lesion rather than from progressive changes in the ancient one. Thirteen patients died within the first two years; 44 have lived for more than two years. A comparison of the data in these two groups is shown below in the attempt to estimate the favourable and the unfavourable factors as regards continuance of life.

Age of the patient.—The younger patients have the better outlook. Levine's experience [11] agrees. But the prognosis is not good in the syphilitic group, with aortic incompetence and narrowing of the coronary orifices, whose symptoms tend to arise in the fourth and fifth decades. The more ample anastomoses of the coronary arteries, which normally develop as age increases, are evidently unable to cope with the extra work which a coronary block imposes upon the neighbouring arteries.

TABLE II

Data derived from the examination of 57 patients, at a variable period, after the occurrence of a cardiac infarct. Forty-four patients lived for more than two years afterwards; 13 died within two years.

—	Duration of life.	
	More than 2 yrs.	Less than 2 yrs.
Age—		
40–49	3	—
50–59	16	3
60–69	19	8
70–79	6	2
Previous health of patient was—		
Good	23	6
Poor	21	7
Anginal attacks before infarct—		
Had occurred ..	14	4
Had not occurred	30	9
Onset—		
Sudden ..	35	10
Gradual ..	9	3
Initial attack—		
Severe ..	24	10
Moderate ..	20	3
Heart—		
Enlarged ..	24	10
Not enlarged ..	20	3
Blood pressure—		
Above 150 mm. Hg	24	11
below ,, ,,	20	2
Electrocardiograms: 50 cases—		
No appreciable abnormality .	6	1
Some ditto ..	32	11
T_1 inverted ..	12	3
T_2 ,, ..	12	5
$T_{1,2,3}$,, ..	—	1
Bundle-branch block: Type I..	5	1
Heart-block (temporary) ..	1	—
Auricular fibrillation	1	—
Dissociation ..	—	1
Retinal arteries—		
Degenerate ..	10	2
Normal ..	34	11
Aortic diastolic murmur ..	—	2
Syphilis (?) ..	5	2

Previous health of the patient.—There is little difference in the data of the two groups. The result evidently depends more upon the extent of the local lesion than upon the general health of the patient, though any deterioration of the general health must react unfavourably upon the process of healing.

The occurrence of attacks of angina pectoris prior to the infarct does not seem to affect the ultimate result. Carey Coombs [12] and White and Bland [13] agree. One could conceive that the occurrence of coronary narrowing in the past would facilitate the anastomotic developments required when an artery becomes blocked. The continuance of anginous attacks, however, predicates that anastomotic developments have not been effective. Saphir's observations,[10] too, show that infarct is a matter of multiple arterial lesions; and any damage to one part of the myocardium must necessarily augment the strain upon the rest of the cardiac muscle.

Mode of onset of the illness.—In some cases an infarct occurs in a man whose health was apparently perfect. In others minor symptoms have preceded the occurrence of the infarct. The results in the two groups seem similar.

Severity of the initial symptoms.—If the doctor in attendance at the time of the initial attack thought that the patient was dying the case has been indexed as severe. The results in those patients whose initial symptoms were severe are less favourable than those in the second group. The difference probably depends upon differences in the extent of the area which is affected, or upon the rapidity of the development of the cardiac ischæmia.

Physical data.—Enlargement of the heart is of evil significance, whether due to hypertrophy or to dilatation. The former indicates pre-existing strain upon the heart; the latter a failure of the surviving muscle to compensate the loss of some muscle cells. *A high blood pressure* is unfavourable. It must be borne in mind that we are now considering the state of affairs some time subsequent to an infarction. In the early days a low blood pressure is an unfavourable sign as Harrington and Wright [14] and Hay [4] state, for it is an indication of myocardial failure. A lessening pulse pressure is particularly ominous. But when convalescence has been attained the case is different. A normal blood pressure suggests that the cardiovascular system is fairly sound, while a high blood pressure suggests the opposite conclusion, and in any case throws a heavy strain upon a damaged myocardium. The large number of patients with *normal retinal arteries* corroborates the idea that coronary block is most frequently a matter of local arterial disease—i.e., atheroma—rather than due to the diffuse affection, arterio-sclerosis. It is impossible to assess the influence of *chronic valvular disease* in a clinical series as the significance of a systolic murmur is often obscure. No case of mitral stenosis is included. There were two cases of aortic incompetence. One patient was aged 76, and generally degenerate, with Cheyne-Stokes breathing, pulmonary infarctions, and copious albuminuria. The lesion in the other patient was possibly syphilitic. He was aged 63; dissociation was present at one time. The first patient died seven months after the infarct; the second lived for nearly a year and a half. *Electrocardiograms* were taken in 50 cases in this series and showed various abnormalities. The records are too scanty to afford useful information as to the relative importance of the different defects, but a normal record is evidently a favourable sign. Inversion of T in all leads and flatness of all T's are unfavourable.

The occurrence of an attack of *syphilis* in the past does not necessarily prove that the cause of the cardiac infarct is syphilitic. Seven patients in this series had probably suffered from syphilis. The duration of life in these patients seems to be little influenced by this factor.

The prognosis after the occurrence of a cardiac infarct is better: among the younger patients; if the initial attack has been moderate in its severity; if the blood pressure is not unduly high; if the heart is not appreciably enlarged; and if the electrocardiogram is normal in character.

Two other factors are important elements in the prognosis: the care that is taken at the time of the infarct, and the reaction of the sufferer to his disability.

"Cure" of an infarct depends upon the development of satisfactory arterial anastomoses around the lesion. The possibilities are considerable but their development is slow. Strain upon muscle cells so long as they are inadequately nourished must be avoided. Our best results have been attained by keeping our patients at absolute rest for a couple of months, permitting a very gradual resumption of physical activities during the next two months, and then a very gradual return to the ordinary habits of life. Success, too, depends largely upon the coöperation of the patient. The well-balanced individual, of good physique and firm muscle, accepts the situation and does his best to aid. The irritable podgy fellow, flabby of brain and muscle, resents the necessary restrictions and cramps the cure. Social and business

commitments may occasion difficulties, but they can be surmounted when the patient realises the nature of his illness, and the nature of the cure. All can recall unfortunate results of a too early return to ordinary activities.

The occurrence of a cardiac infarct occasions grave danger to life, but if the patient survives the onset satisfactorily he has a fair chance of reasonable health even for many years.

We must acknowledge, with grateful thanks, the kindly help of our colleagues who have supplied us with many of the data on which this paper is based.

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SOME OBSERVATIONS ON EXPERIMENTAL RENAL SECTION

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THE effect of hemisection of the kidney is still a matter of dispute. With increasing accuracy of diagnosis the indications for this operation in man have become very few, but there may still be occasional cases in which, despite all investigation, uncertainty exists, and such an exploration might be desirable. The question arises whether it is justifiable, and I felt that it would be of interest to study experimentally the effects of the operation upon (*a*) the incised kidney and (*b*) the remaining normal kidney.

INVESTIGATION

Twelve bitches were subjected to a preliminary cystoscopy in the course of which 5 c.cm. of 0·4 per cent. indigo-carmine was injected intravenously and the ureteric efflux from each side noted. (This method of investigating the renal function was chosen because it was found to be the most practicable. It had originally been hoped to catheterise the ureters and collect specimens from each side, but this proved too difficult to perform with certainty.) After a few days' interval the kidney on one side was divided completely from pole to pole until the pelvis was laid open. In order to control the hæmorrhage, a Crile's clamp was placed on the renal pedicle before the incision was made. The two halves were then brought together by two or three mattress sutures (catgut No. 2) passing through the parenchyma, three being usually required. The operation was completed with all speed, seldom occupying more than five minutes and never more than ten, in order to avoid the effects of prolonged anoxæmia. (A clamp on the pedicle would be used in clinical practice, and it was felt that the experimental operation should approximate as closely as possible in all details, although otherwise it might have been better to avoid it.) After removing the clamp any further oozing was controlled by pressure with a hot gauze. The renal capsule was sewn up separately, the kidney replaced, and the wound closed. This was the operation performed on the first 6 dogs. The second 6 dogs had an identical operation except that the halves of the kidney were brought together by the use of Lowsley's ribbon catgut inserted, in the way he describes, through the capsule and carried round the kidney. By this method the objection that strangulation of tissue, including blood-vessels, would occur is eliminated, and so this operation should be the better one to perform. This investigation was undertaken partly, therefore, to compare the results of the two methods.

After the operation the animals were cystoscoped as far as possible at monthly intervals, using exactly the same technique with regard to anæsthesia and dose of dye as on the first occasion. Particular attention was paid to the time of appearance and concentration of the drug at each ureteric orifice.

At the end of three months the animals were anæsthetised with Luminal, laparotomy was performed, and catheters were passed into the ureters. Phenolsulphone-phthalein (1 c.cm.) was given intravenously and specimens collected from both kidneys. In practice it was found necessary to give 250 c.cm. of saline intravenously to promote diuresis or no specimens could be obtained. This, while interfering with any determination of total renal function, would not invalidate a comparison of that of the two sides, which was here required.

RESULTS

Table I. gives details of the operation and results; Table II., and the ensuing text, summarises them. It will be seen that 4 dogs died. One of these (No. 39) was suffering from other conditions which may have been partly responsible for death, but in any case the kidney was completely destroyed so that from the point of view of this operation it represents a failure. One other had complete atrophy, so that 7 survived with functioning kidneys. Of these 7, 5 had changes of greater or lesser degree but did not show progressive impairment or degeneration during the period of observation.

Renal Function.—The results obtained may be summarised as follows:—

(*a*) *Injured kidney.*—Eight showed marked impairment in one or other test. (See Table I., Nos. 15, 17, 20, 30, 35, 36, 37, and 39.) Three showed slight impairment in one or other test (Nos. 16, 19, and 29).

(*b*) *Sound kidney.*—Eight showed increased function (Nos. 15, 16, 19, 20, 29, 30, 37, and 39).

The most interesting feature was the apparent increase of concentration in the indigo-carmine excreted by the sound kidney; although given under identical conditions the dye was excreted in a shorter time and stronger concentration than before the operation. Along with this there was usually evidence of impairment in the operated kidney, so the conclusion can hardly be avoided that the sound one was doing more work because of the injury to the other.

Pyelography.—It will be seen from Table I. that—

Six showed marked deformity of the pelvis on the operated side (Nos. 15, 16, 17, 20, 29, and 30).

Two showed slight deformity of the pelvis on the operated side (Nos. 19 and 35).

Four were not investigated. The two cases of hydronephrosis fall into this latter group.

TABLE I.—OPERATIONS AND RESULTS

Dog.	Operation.	Cystoscopy. Time of appearance of dye (minutes).		Pyelography.		P.S.P.	Result.	Post-mortem and histological examination.
		Before Op.	After Op.	Intravenous.	Retrograde.			
15	Mar. 9, 1934. Lt. side, 3 mattress sutures.	Rt. 6 Lt. 4.	(1) Rt. (conc.) 2½. Lt. 7. (2) Rt. (conc.) 2½. Lt. 5.	Rt. visualised. Lt. not visualised.	No abnormality detected.	—	Died June 20.	Lt. kidney shows area of destruction of tubules particularly in cortex. Prussian blue injected into aorta demonstrates rt. vessels well filled. Lt. side not well filled and avascular areas related to the scarred tissue.
16	Mar. 15, 1934. Rt. side, 3 mattress sutures.	Rt. 3½. Lt. 4½.	Rt. 4½. Lt. (conc.) 4.	—	Rt. pelvis abnormal in contour.	Rt. 20 %. Lt. 25 %.	Killed June 27.	Rt. kidney deformed (Fig. 1). Section shows areas of scarring in cortex and medulla with destruction of blood-supply as demonstrated by injection of carmine-gelatin.
17	Apr. 3, 1934. Rt., 3 sutures.	Failure.	Failure.	Rt. small pelvis not visualised well suggests poor function. Lt. pelvis visualised well.	Alt. in size and shape of rt. pelvis (Fig. 2).	Rt. 20 %. Lt. 30 %.	Killed Sept. 4.	Rt. kidney atrophied less than half the size of left. Section shows areas of destruction of tubules with deficient blood-supply in these areas as demonstrated by injection of carmine-gelatin into aorta (Fig. 3). Vessels in lt. also better filled than in rt.
18	Mar. 19, 1934. Rt., 3 sutures.	Rt. 6. Lt. not seen.	—	—	—	—	Died Mar. 25.	Rt. kidney complete hydronephrotic shell and full of blood (Fig. 4). Section: hydronephrosis and hæmorrhage.
19	Mar. 27, 1934. Lt., 3 sutures.	Rt. 8. Lt. 6.	(1) Rt. 5. Lt. 7. (2) (conc.) Rt. 4. Lt. 7. (3) (conc.) Rt. 4. Lt. 7.	Lt. pelvis ureter visualised clearly even better than right.	Lt. pelvis shows some abnormality of contour.	—	Killed Sept. 14.	Lt. kidney much smaller than rt. and softer in consistency but otherwise looks normal. On section there is marked destruction of tubules in the cortex, scarcely any normal tissue being left.
20	Apr. 9, 1934. Lt., 3 sutures.	Both 4.	(1) Rt. (conc.) 3½. Lt. 4. (2) Rt. (conc.) 1. Lt. 5.	Rt. pelvis well visualised. Lt. not seen.	Some abnormality at upper calyces.	Rt. 60 %. Lt. 35 %.	Killed Sept. 18.	Lt. kidney shows destruction of tubules at upper pole. Blood-supply (carmine-gelatin) deficient here. Blood-vessels on rt. side well filled; better than on lt. (Fig. 5).
29	Dec. 20, 1934. Rt., Lowsley's technique.	Both 14.	(1) Rt. 12. Lt. 7. (2) Rt. nil. Lt. (conc.) 10.	—	Rt. pelvis deformed.	Both 15 %.	Killed Mar. 21, 1935.	Rt. kidney small, scarred, and adherent to liver section. Destruction of cortex and pyelitis.
37	Jan. 22, 1935. Rt., Lowsley's technique.	Both 12.	Rt. 20. Lt. (conc.) 5.	—	—	—	Died May 6.	Lumbar sinus present and palpable lump in kidney region. P.M. Rt. pyonephrosis.
30	Dec. 28, 1934. Lt., Lowsley's technique.	Both 2½.	Rt. (conc.) 2½. Lt. nil.	—	Lt. hydronephrosis.	—	Killed Mar. 28, 1935.	Lt. kidney small. Section shows areas of dilatation of tubules as in hydronephrosis and some areas of fibrosis and some pyelitis.
35	Jan. 15, 1935. Rt., Lowsley's technique.	Both 15.	—	—	No definite abnormality.	Rt. 5 and delayed. Lt. 35 immediate.	Killed. Apr. 23.	Rt. kidney half size of lt., scarred and adherent to liver but on section there is plenty of normal looking tissue left.
36	Jan. 15, 1935. Lt., Lowsley's technique.	Failure.	Failure.	—	—	Rt. 10. Lt. nil.	Killed May 2.	Lt. kidney small, scarred, and section shows extensive destruction of tubules with deficient blood-supply as demonstrated by Berlin blue injection into aorta.
39	Jan. 29, 1935. Rt., Lowsley's technique.	Both 17.	Rt. nil. Lt. (conc.) 3.	—	—	—	Died May 9.	Rt. kidney almost complete destruction of cortex with a marked calcium deposit. Pyelitis present.

P.S.P. = phenolsulphone-phthalein.

TABLE II.—SUMMARY OF RESULTS

Animal.	Technique.		Hydro- or pyo-nephrosis.	Complete atrophy.	Marked diminution in size, obvious deformity.	Slight changes only.
	Mattress sutures.	Lowsley's.				
15	+	—	—	—	—	+
16	+	—	—	—	+	..
17	+	—	—	+	—	—
18	+	—	+	—	—	—
19	+	—	—	—	+	—
20	+	—	—	—	—	+
29	—	+	—	—	+	—
30	—	+	—	—	+	..
35	—	+	—	—	+	—
36	—	+	—	—	+	—
37	—	+	+	—	—	—
39	—	+	—	+	—	—
..	6	6	2	2	6	2

Two had hydronephrosis; 2 complete atrophy; 6 marked diminution in size and deformity to the naked eye; 2 changes slight.

As a matter of interest it may be worth recording that one other dog developed renal calculi. This animal had had a preliminary nephrectomy and then, after an interval, hemisection of the remaining kidney. At cystoscopy a month later this kidney excreted a concentrated dye, but after another month the animal suddenly died. Post mortem the kidney, though small, looked otherwise normal, but on opening it many calculi were found in the pelvis.

Histological Examination.—The general findings were areas of tubular destruction, most conspicuous in the cortex. These were probably related to areas of deficient blood-supply. In order to investigate this point carmine-gelatin was injected into the aorta while the animals were still alive, since it was felt that this method would not give results

FIG. 1.—Kidneys of Dog 16 showing partial atrophy of right kidney.

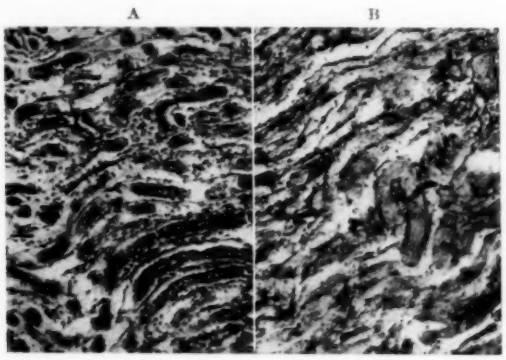

FIG. 3 (Dog 17).—Destruction of tubules on right side (B); hypertrophy of tubules on left (A).

of much significance after the circulation had stopped. The carmine was blown in under constant pressure and then the circulation released as quickly as possible before the animal died. Four rabbits treated in the same way (hemisection of kidneys) were given injections of intravital trypan-blue several days prior to the carmine injection, and in this way a combined picture of the tubular function and the blood-supply was obtained. These sections show an intense blue in the tubules of the sound side, whereas on the operated side there is considerable deficiency of blue in the tubules where these are damaged, and here the carmine shows defective blood-supply. These appearances are interpreted as meaning that the function of the sound kidney has increased to counter-balance the damage done to the other side.

FIG. 2 (Dog 17).—Retrograde pyelogram showing partial atrophy of right kidney.

SUMMARY AND CONCLUSIONS

Among 12 dogs on which hemisection of a kidney was performed there were 4 deaths; and 1 other animal showed atrophy of the kidney. Of the remaining 7, 2 can be passed as normal, while 5 had greater or lesser degrees of injury. Observation over three months suggested that the damage was not progressive, although the sound kidney was doing extra work.

It seems clear from this investigation that in assessing the anatomical and physiological condition of the kidneys too much reliance should not be placed on the usual tests of renal function as carried out clinically. Conclusions must be based for the most part on the naked-eye, and to a less extent the microscopic, appearance of the kidneys. In considering the question whether hemisection is

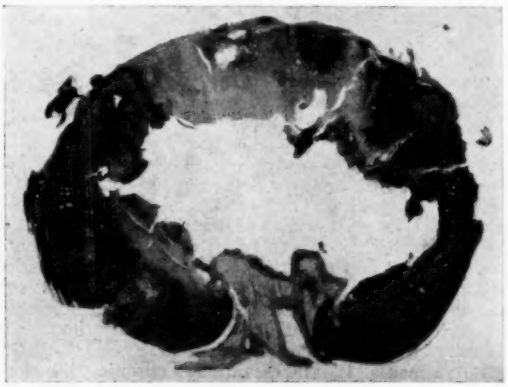

FIG. 4 (Dog 18).—Hydronephrosis of right kidney.

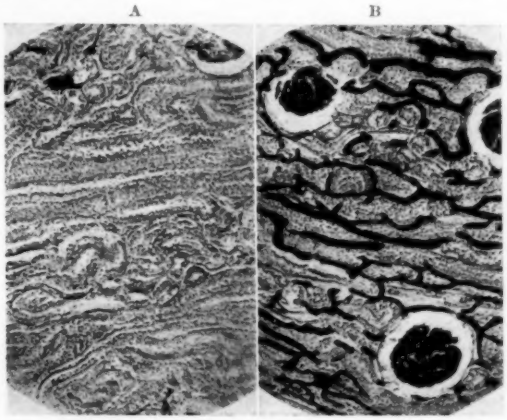

FIG. 5 (Dog 20).—Carmine-gelatin injection five months after operation. Increased blood-supply in right kidney (B); decreased blood-supply in left.

worth while, it must be remembered that it falls into the category of exploratory operations. A sine qua non of such an operation is that it shall do little harm to the organ explored, and hemisection receives no justification from experiments in which the kidney was severely damaged in 4 cases out of 12 cases, and largely atrophied in another.

Nor does it seem that Lowsley's technique is noticeably less deleterious in its effects than the ordinary operation in which mattress sutures are used.

I am indebted to Dr. F. T. Ranson for suggesting the investigation, to Mr. R. V. Dent for the photographs, and to Mr. Henderson for the sections, and to Messrs. Davis and Geck Inc. for a supply of ribbon catgut.

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Clinical and Laboratory Notes

PERFORATED GASTRIC ULCER

RECOVERY IN A MAN AGED 81

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RECOVERY after perforated gastric or duodenal ulcer appears to be rare in the aged. Schulein [1] describes two cases in which a man and a woman, both aged 76, died after operation. Speck [2] records one case of a woman aged 69 who survived for eight weeks after operation and then died of heart failure; he also gives statistics of eight others all over the age of 60, but does not mention their fate. Graves [3] describing eight cases between the ages of 60 and 70 had a recovery in three of them; while Gilmour and Saint,[4] in a series of sixty-four cases, give the age of five as over 60, the oldest male being 67 and the oldest female 69; only three of the sixty-four failed to recover. Read,[5] Brown,[6] and Scotson[7] also give statistics of perforation in patients over the age of 60, but they do not give information about the fate of individual patients.

The case I describe seems worthy of record in view of the patient's age and his uninterrupted recovery.

On admission to the Archway Hospital the patient gave a history of dyspepsia for the past two years, but he had been comparatively well until the morning of his admission to hospital, when he had suddenly collapsed with severe abdominal pain while engaged in sweeping out his room; he had not vomited. He was an elderly man with severe arterio-sclerosis. The pulse-rate was 116 and the temperature 99·2° F.; although obviously in considerable pain he was not severely collapsed and was able to give a clear account of himself. The abdomen moved very little with respiration; it was rigid throughout, and there was no liver dullness.

The operation under general anæsthesia was begun nine hours after perforation. The peritoneal cavity was found to contain gas and free fluid, and there was a perforation in the anterior surface of the stomach near the pylorus. This was closed with interrupted stitches and reinforced with a piece of adjacent omentum. The pouch of Douglas was drained by a tube through a suprapubic stab wound. The patient's convalescence was uneventful and the wound healed by first intention. On discharge home 25 days after operation the scar was sound and the patient walked well. When seen again six months later he stated that he had rapidly gained strength; he now looked after himself and frequently walked 3–5 miles daily; he had no dyspepsia or inconvenience and eats a light mixed diet.

The radiologist's report on a barium meal reads: "The stomach showed normal appearance except for some irregularity on its lesser curve near the pylorus. The latter functioned well, and on pressure the duodenal cap could be well filled; no ulcer crater could be demonstrated either in the stomach or the duodenum."

A reference to the records of Somerset House confirms the age of the patient as 81.

My thanks are due to Dr. C. D. Agassiz, medical superintendent of the hospital, for permission to publish this case, and to Dr. F. G. Nicholas for his report on the barium meal.

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POLYSEROSITIS

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AND

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THE subject of polyserositis is complicated by the confusion and complexity of nomenclature; several conditions clinically similar are included under the same title. The term seems most suitable to describe a chronic hyperplastic serositis of the pleural, peritoneal, and, sometimes, pericardial cavities. Some of the synonyms are multiple serositis, Concato's disease, Pick's disease (pericarditic pseudocirrhosis of the liver), diffuse chronic hyperplastic perihepatitis, chronic hyaline perihepatitis, chronic proliferative peritonitis, and Zuckergussleber of Curschmann.

Adherent pericarditis of known ætiology may end with heart failure, chronic venous congestion of the liver, œdema of the lungs, pleural effusion, and ascites, and yet be known by any of the above names, particularly Pick's disease. It does not, however, show the widespread, uniform picture of serous hyperplasia and polyserositis described below, though it is not unusual to find sugar-icing of the liver, peritoneum, and pleura in a minor degree. Chronic nephritis, particularly if associated with arterio-sclerosis or alcoholism, may cause or be associated with Zucker-gussleber, and pearly spots on the pericardium; but the fibrosis never approximates to that met with in polyserositis.

Polyserositis appears to be distinct from "adherent pericarditis" of rheumatic, tuberculous, or pyogenic origin. Its association with chronic nephritis or alcoholism may be fortuitous or causative, the ætiology of both being unknown. In the case described this association was absent.

Polyserositis is an essentially chronic disorder of the middle and later periods of life, whereas pericarditis is usually seen in young people. The symptoms are insidious—namely: (1) Abdominal

pain, due to involvement of peritoneum. (2) Recurrent effusions into serous cavities, requiring more frequent tapping than those of simple cirrhosis of the liver or less virulent forms of pleurisy. (3) Obstruction of the great veins of the trunk with œdema of the limbs. Despite these symptoms the patient's condition may remain good for as long as five or ten years. (4) There is also apparent glandular enlargement in axillæ and groins, due to embedding of lymphatic nodes in active fibrosis of connective tissue.

Radiography may help in deciding that the heart is fixed, the normal movement being replaced by an up-and-down motion; the cardiac enlargement distinctive of pericarditis may be absent in polyserositis. The electrocardiogram may show fixation of axis, due to partial or complete immobilisation of the heart.

The fluid obtained from the pleural cavities is usually clear, yellow, cell-free, and sterile, and contains 3 per cent. of albumin; the ascitic fluid has occasionally been described as chylous.

The fibrosis may be greater on the right side of the body, possibly because there are more lymphatic channels through the right cupola of the diaphragm than through the left. Death results from slow constriction of lungs, heart, and great vessels.

CASE-HISTORY

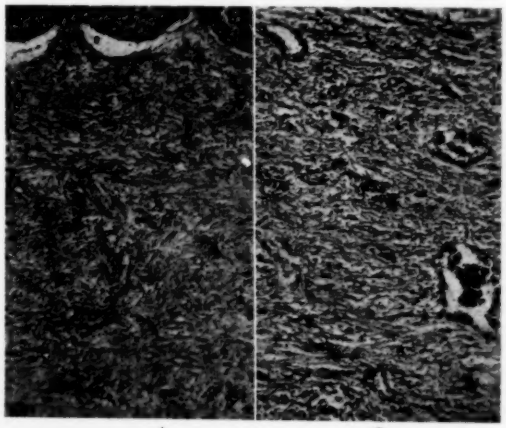
In 1929 a man, aged 38, sustained an "injury" to the sacro-iliac region while at work. There were no radiographic signs, but he was thenceforward unable to work and was given weekly compensation. In November, 1933, he was in hospital with pain in back; "loss of use" and swelling of legs; cough, six months; sense of constriction in throat. He discharged himself after three days, but in December, 1933, was admitted to another hospital.

Complaint: pain right chest and pit of stomach, especially after food; dyspnœa; swelling of legs; cough.

Physical state: cyanosis; distended chest veins; solid middle and lower lobes right lung; right clear pleural effusion; fixed, firm glands in axillæ and femoral triangles; much frothy sputum; heart displaced to left; pulse-rate 120; afebrile; ascites absent; tender liver; Wassermann reaction negative; no anæmia; 13,600 total leucocytes per c.mm., 11,600 (84 per cent.) being neutrophils; X ray ? neoplasm right lung.

Diagnosis: neoplasm right lung.

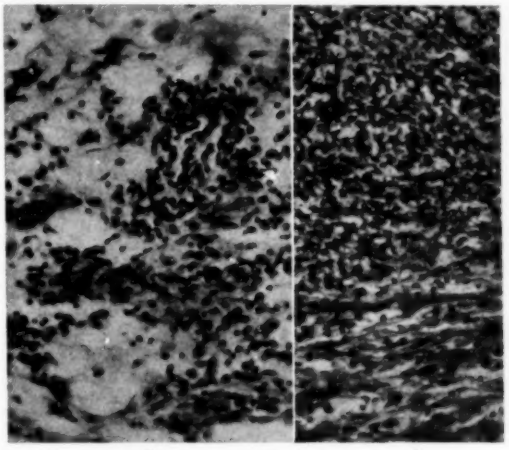
After discharge the right pleura was tapped every two or three weeks. Accidental pneumothorax occurred once and appeared to give relief and postpone the next tapping.



1 2

FIG. 1.—Fibrosis encroaching on inguinal gland. Very cellular, vascular, and of active growth. (× 100.)

FIG 2.—Pleura. Features similar to Fig. 1. (× 100.)



3 4

FIG. 3.—Subpleural fatty connective tissue; vascularised and permeated by lymphoid and plasma cells. (× 200.)

FIG. 4.—Hepatic peritoneum. Portion of acute inflammatory focus; polynuclear leucocytes numerous. (× 200.)

There was increase of hepatic pain and tenderness, with œdema of adjacent anterior abdominal wall; more frequent acute epigastric pain and vomiting, only relieved by morphia, and slight ascites. In October, 1934, he was readmitted to hospital. There was loss of weight; tense abdomen, with slight ascites; slight pleural effusion and pneumothorax; 70 per cent. hæmoglobin, 9200 neutrophils per c.mm.; liver enlarged downwards and tender; signs of cardiac hypertrophy and dilatation absent. An inguinal gland was excised for examination. The patient discharged himself after one week, and in November, 1934, at the age of 43, he died by sudden failure of right side of heart.

NECROPSY

General.—Pale; moderate wasting; upper abdomen prominent and tense; chest assymetrical, left side more prominent anteriorly than right; varicose distension of superficial veins of neck and upper half of chest; diffuse swellings, apparently glandular, in both groins and both axillæ.

Thorax.—Back of sternum only detached from pericardium and mediastinum by cutting dense, white, rather elastic tissue, which spreads laterally over anterior borders and surfaces of both lungs. Large, slightly hæmorrhagic pleural effusions (bilateral). Left lung compressed by pleural effusion; substance œdematous and congested; lung free except on medial aspect, where the pleura fuses with general mediastinal mass of dense, white tissue; lateral and posterior left pleura normal. Right pleural sac partly obliterated by loculi of yellow, gelatinous exudate; right lung much collapsed, encased in dense coat of "sugar ice," with pitted surface, and 2 to 7 mm. thick; upper lobe removed by incision through large areas of fusion of visceral and parietal pleura; right parietal pleura, where free, is 5 to 8 mm. thick; this sclerosis penetrates upper intercostal spaces on both sides, infiltrates the axillary spaces and embeds groups of lymphatic glands of normal appearance; sclerosis lacks defined limits and resembles mediastinal tissue. Anterior part of pericardium thick and adherent to back of sternum and anterior surface of heart. Heart distorted by antero-posterior compression, showing atrophy of muscle and marked dilatation of right side.

Abdomen.—White, dense sclerosis covers both surfaces of both sides of the diaphragm, upper surface of liver, left perirenal tissue, and whole of prevertebral tissue, so that a solid mass embeds aorta, inferior vena cava, duodenum, and pelvic portions of ileum and colon. In front of the spine this mass is 20 to 30 mm. thick. Lower border of liver is at level of umbilicus; left lobe adherent to anterior

abdominal wall; liver weighs 1·9 kg. (plus 20 per cent.). Spleen adherent to stomach and diaphragm. Sclerosis involves both iliac sets of main vessels, penetrates to the femoral triangles where lymphatic glands are embedded, as in axillæ. Lateral peritoneum of the pelvis is very thick, burying the nerve-roots to the lower limbs. Skull and spinal column, central nervous system, and remaining viscera normal.

Microscopical.—Rather than hyaline lamination, the features of the fibrosis are cellularity, vascularity and active growth, suggesting active infection, though micro-organisms could not be demonstrated in sections. The penetration of the fibrosis to the axillary and inguinal spaces appears unrecorded in the literature.

Polyserositis should be considered, therefore, in the presence of any or all of the following symptoms: mediastinal or abdominal venous obstruction, recurrent effusion into serous cavities, adherent pericardium, and enlargement of the liver—even if these are associated with apparent glandular enlargement. In the case described the pericardial lesion was an embedding of the heart and great vessels rather than adhesion between the parietal and visceral pericardium. Thus it follows that polyserositis should be considered as an alternative diagnosis to mediastinal neoplasm, Hodgkin's disease, adherent pericarditis, and cirrhosis of the liver.

We wish to thank Dr. A. E. Rayner for his permission to record this case which was under his charge, and Mr. H. C. Taylor for the photomicrographs.

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HISTAMINE IONISATION IN RHEUMATISM AND ALLIED CONDITIONS

ANALYSIS OF ONE HUNDRED CASES

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ALTHOUGH the series of consecutive cases reviewed here is somewhat short, an analysis of the results may be of value in showing how histamine can be used in the routine treatment of rheumatism. The total number of applications was 2496—an average of 25 per patient—and it was usually found that at least 12 were required for any permanent improvement. Apart from an insignificant number who were found to be constitutionally unsuited for balneological treatment, all the patients received concurrently some form of brine bath, and often massage in addition.

The method of treatment employed is essentially the same as that already described,[1] with the notable addition of a preliminary preparation of the area with multiple punctures and scratches produced by a special scarifier. This procedure is based on that recommended by Vas,[2] and is now finally considered beneficial. In most cases the histamine was given daily and it is considered important that baths or other additional treatment should follow and not precede its administration.

In the accompanying Table the various groups have not been subdivided and the nomenclature is based on the recommendations of the Arthritis Committee.

Clinical Analysis

—	Males.	Females.	Total.	Cured.	Greatly improved.	Improved.	No change.	Worse.
Fibrositis	18	29	47	7	27	11	—	2
Neuritis	6	4	10	7	1	2	—	—
Osteo-arthritis ..	9	4	13	—	—	9	4	—
Rheumatic arthritis ..	1	2	3	—	—	1	2	—
Villous arthritis ..	3	20	23	—	14	8	—	1
Spondylitis	2	—	2	—	—	2	—	—
Traumatic arthritis ..	2	—	2	2	—	—	—	—

In this Table only the disabled parts that received treatment are considered: where there was a mixed condition the remaining disabilities are ignored.

NON-ARTICULAR CONDITIONS

Fibrositis.—The majority in this group had lumbar and shoulder-girdle fibrositis. Of the 47 cases, 7 were passed as clinically cured; all except one showed very great or great improvement, and in most of them it was believed that sufficient treatment would have completely removed the disability. The greater number had massage in addition to baths. The two cases which are reported as worse were complicated by an erratic "psyche" which precluded the possibility of relief from any ailment, and treatment was not persevered with.

Neuritis.—In this group are included cases of root and trunk sciatica, and brachial neuralgia. Of the 10 patients treated, 7 were discharged and have remained free from pain. Improvement was unsteady in all and there were occasional recrudescences, each less severe than the one before. One fell short of complete recovery because the patient persisted in taking forbidden exercise.

CHRONIC JOINT CHANGES

Osteo-arthritis.—Of the 13 cases, 9 showed improvement; 6 of these were of the hip, 2 of the knee, and 1 of the shoulder-joint. There was a steady lessening of pain and usually an increase of movement after the first application. Of 4 patients that returned only 1 had become worse in the interval (seven months). In 4 the improvement lasted only a few hours.

Rheumatoid Arthritis.—Only 3 patients were treated, and of these 1 alone showed definite improvement.

Villous Arthritis.—The knee was affected in each of the 23 cases, and there was almost always a very gratifying result, with loss of pain and greatly increased movement. Massage was given in every case. In this group again 1 patient failed to respond or persevere.

Spondylitis.—The 2 cases treated were both of the osteo-arthritic type, the patients being men of 35 and 38. There was much improvement in posture, with a great lessening of pain, and this progress had continued in one of the patients who returned after 3½ months for a second course. Plaster shells were fitted for night use, and baths and massage were also given.

TRAUMATIC CONDITIONS

Both the patients in this group had "badminton elbow" and recovered rapidly and uneventfully with

[1] Mackenna, F. S.: THE LANCET, 1934, i., 1228.
[2] Vas, S.: Deut. med. Woch., 1932, lviii., 1009.

five and seven administrations each. No other forms of treatment were used.

COMPLICATIONS AND INTERCURRENT DISEASE

Collapse.—There were three cases in which histamine treatment caused collapse.

CASE 1.—Female, aged 49. Fibrositis. Menopause at present; extremely neurotic. This patient did moderately well until the seventh treatment, but suddenly collapsed about a minute after beginning the eighth; the pulse disappeared at the wrist and there was slight vomiting. She gradually recovered after some hours, but had hysterical prostration afterwards. No remedy beyond the ordinary was employed.

CASE 2.—Female, aged 68. Sciatica and fibrositis. She was very neurotic and began to show signs of collapse after the third treatment, on the appearance of the facial flush. Ephedrine (1 c.cm.) was injected, with rapid improvement and complete recovery in about eight minutes. Subsequently five more treatments were successfully given and there was considerable improvement, but the patient became more "nervy," refused all treatment, and departed.

CASE 3.—Female, aged 73. Fibrositis and brachial neuralgia. This woman was very sensible and vigorous, and a first course of 42 treatments resulted in complete cure of the neuralgia and an improvement in the old-standing lumbar and gluteal fibrositis. A second course was started five months later but at the third treatment there was a dramatic and severe collapse. Rapid relief was obtained from ephedrine, and the patient afterwards declared that she felt better than for many years and that all the backache had gone. Further treatment was given to the lumbar region and there has been no return of pain after eight months.

With the exception of hysteria, which was conspicuously absent in the third patient, there was nothing remarkable about any of these cases, nor was the collapse due to an overdose in the usual sense. The onset of symptoms was sudden and not preceded by any visible signs, nor did the patient notice anything unusual. The most careful inquiry subsequently into diet, &c., failed to produce a solution. The collapse presumably bears some relation to the (so far unexplained) variation in histamine tolerance shown by each patient from day to day. Ephedrine appears to be an efficient antidote.

Intercurrent Diseases.—In 5 cases the systolic pressure was over 200 mm. Hg, and showed not only the customary post-histaminal fall of several millimetres noted by Bisset and Woodmansey,[3] and Shanson and Eastwood,[4] but also a definite downward tendency throughout the course. This was, however, never greater than a total of 15 mm. Two cases of chronic asthma and bronchitis were included and appeared to be unaffected either temporarily or permanently by the drug; in other respects they progressed normally. Gross valvular and myocardial lesions were rejected, but those with less advanced disease that were suitable for bath treatment were accepted and took the histamine successfully.

CONCLUSIONS

It is to be regretted, for the purposes of this analysis, that other forms of treatment could not be excluded, but it is noteworthy that many patients who have taken a course of baths for several years are emphatic in their statements that histamine has greatly increased the benefit received; undoubtedly it also increases the rate of recovery. It may be said to fail in cases of the rheumatoid type, where the joints are swollen and "doughy" and the skin clammy, but in all others, and particularly in villous arthritis, fibrositis, and neuritis, its value is unquestionable.

[3] Bisset, A. A., and Woodmansey, A.: THE LANCET, 1933, ii., 1018.
[4] Shanson, B., and Eastwood, C. G.: Ibid., 1934, i., 1226.

NON-TRAUMATIC SURGICAL EMPHYSEMA

IN ASSOCIATION WITH ACTIVE PHTHISIS

BY DAVID N. DOBBIE, M.B. Edin.
RESIDENT MEDICAL OFFICER, BIRKENHEAD MUNICIPAL HOSPITAL

SURGICAL emphysema occurring in a phthisical patient is usually superficial and due to faulty artificial pneumothorax technique. Interstitial emphysema, though it is not a very uncommon complication of broncho-pneumonia and whooping-cough, is rarely met with in pulmonary tuberculosis, presumably because of the fibrotic changes taking place in advance of the active lesion. When it does occur it generally follows an unusually severe bout of coughing which ruptures an alveolus and allows air to escape into the interstitial tissue of the lung, and so, by way of the hilum, to the mediastinum. From here the air passes to the subcutaneous tissue of the neck, face, and chest, thus establishing a "surgical" emphysema. This condition is believed to be rare enough to warrant the publication of the following case.

A man, aged 26, was admitted to Birkenhead Municipal Hospital on Nov. 12th, 1935, having a history of chest trouble of at least six years' standing. He was extremely emaciated and complained of asthenia and cough; the temperature was remittent, and sweating was profuse. Clinical examination revealed scattered patches of consolidation in both lungs, with fairly extensive cavitation at the right apex. Tubercle bacilli were present in the sputum.

No improvement took place during the next five weeks; emaciation became more obvious, and the cough assumed a paroxysmal character. On Dec. 19th, at 10.30 A.M., the patient complained of slight dysphagia and a bilateral swelling of the neck was noticed. By midday the neck had become increasingly swollen and crepitus was elicited on pressure. The superficial tissues of the chest wall and lower jaw became involved, and on the following day the face, particularly on the left side, was greatly swollen and disfigured, with massive involvement of the tissue of the lower eyelids. The patient was very dyspnœic and becoming cyanosed. Sweating was profuse. On Dec. 21st the surgical emphysema had spread to the anterior abdominal wall and flanks, and was encroaching on the lower limbs. Breathing now became exceedingly embarrassed and death took place at 8.20 P.M., 58 hours after the onset of the acute symptoms.

On post-mortem examination both lungs were found to be studded with tuberculous foci with considerable cavity formation. No collapse was present on either side. The mediastinal tissues were ballooned up with air, and this could be traced to the subcutaneous tissues behind the clavicles.

There was no history in this case of artificially induced pneumothorax, nor did the post-mortem examination reveal any evidence of spontaneous pneumothorax.

I wish to thank Dr. R. A. Grant, medical superintendent, for permission to publish these notes.

ROYAL MASONIC HOSPITAL, LONDON.—The figures for this hospital for the last half of 1935 show an excess of expenditure over income of £7141, against £9425 in 1934, although the patients resident on daily average have been 125 against 113. Lord Marshall, in submitting the treasurer's report at the annual general meeting on Jan. 29th, stated that when the nurses' home was complete and ready for occupation the average costs would be further reduced and the position considerably improved.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on Feb. 5th, with Mr. SAMPSON HANDLEY, the president, in the chair, a discussion on

Sterilised Surgical Catgut

was opened by Sir WELDON DALRYMPLE-CHAMPNEYS. He said that the occurrence recently in rather rapid succession of a number of cases of post-operative tetanus, either certainly or probably due to the use of what might be termed "home-cured" catgut, made it important to emphasise the dangers of inefficiently sterilised material; though control under the Therapeutic Substances Act had raised the general standard of sterility of surgical catgut on sale in this country. The raw material from which catgut was prepared was the small intestine of the lamb, and was heavily infected with micro-organisms of many kinds, including pathogenic spore-bearing anaerobes. On reaching the manufacturer the raw material was either thawed out (if frozen) or washed free from salt (if this had been used as a preservative) or, if dried, soaked in dilute alkali to make it soft and pliable. Even if not dried it usually received this soaking. The gut was next split into ribbons longitudinally and then scraped to remove the inner and outer layers, leaving only the submucosa. The ribbons were measured and spun, two or more ribbons being twisted together to form a string. The gauge of the finished gut depended on the number of ribbons spun together. Sometimes the ribbons were partially sterilised before spinning by soaking in disinfectant solution. The strings were dried under tension and polished with pumice or emery, and then graded by measuring their calibre with a gauge. It was important that the gauge of any individual string should vary only very slightly at different points in its length. If hard slowly absorbed gut was required the strings at this stage were immersed in a chrome bath. Gut partially sterilised before spinning was often sold as "internally sterile" or "partially sterilised" catgut and, as it was not called "sterilised surgical catgut," did not come under the control of the Therapeutic Substances Act. Purchasers of such catgut were apt to assume that the product required less sterilisation than raw catgut, and some of the wound infections following the employment of catgut sterilised by hospitals for their own use were, he believed, attributable to this erroneous assumption.

Heat was the most reliable sterilising agent, provided the physical properties of the gut could be preserved unimpaired. The heating of catgut rapidly in air to a temperature sufficient to destroy anaerobic spores, if it did not actually burn it, rendered the gut as hard as wire and extremely brittle. Methods had been devised for overcoming this difficulty, and some had proved completely successful, but there was a temptation to reduce the temperature or time of heating below the safety point if the tensile strength of the gut was found to be unsatisfactory. Iodine had been used for sterilisation of catgut because of its penetrating power. Owing to its colour, the degree of penetration of iodine could be verified by examining a cross-section of the gut. Excess of iodine must be removed at the end of the process because prolonged action rotted the gut, reducing its tensile strength. The value of mercurial salts for sterilisation of catgut had been overrated; they were bacteriostatic only, though they had some disinfectant action on the exterior of the gut. Hydrogen peroxide was an efficient sterilising agent, but as it caused spun gut to swell it was never used alone, but employed for treating the wet gut as a preliminary to the action of iodine. Essential oils had a negligible action on spore-bearing bacteria, and it was difficult to account for their popularity among hospitals sterilising their own gut.

After sterilisation, the gut was introduced into containers, together with a filling solution. The principal types of container were sealed glass tubes; glass tubes closed with a rubber cork and metal screw cap; similar tubes containing several reels of gut, the ends of which were drawn out through side tubes, closed in the manner described; waxed cardboard cartons; and finally multiple sealed paper envelopes each containing a single coil of dry gut. Any packing which allowed repeated extractions of portions of gut from the same container must be regarded as highly unsatisfactory. Filling solutions should only be regarded as useful for killing organisms on the *outside* of the gut which had got there during packing. Tubes were sealed in the ordinary way in the flame of a blowpipe.

Catgut might become recontaminated:

(1) By handling before it was put into the container. Sterilisation inside the container was therefore desirable.

(2) By air-borne organisms, from dust or the breath of operatives, entering the container before sealing. This source of contamination might be avoided by the use of metal boxes with sliding lids to hold the containers, rubber gloves, face masks, and a glass shield over the sealing table.

(3) By the use of unsterile containers.

(4) By the use of unsterile stoppers in the interval between filling and sealing.

(5) By the use of unsterile filling solutions. Even solutions containing so-called antiseptics might provide such a source of contamination if they were incapable of killing the spores of anaerobes.

The examination of a reasonable length of any batch of catgut by sterility tests could not ensure that the whole of the batch was sterile. A licensee under the Act was required to carry out sterility tests on not less than 1 per cent. of the material constituting a batch. The control tests carried out by the licensing authority were identical with those which the licensee was required to perform as a routine.

In February, 1933, Dr. R. O. Clock, of New York, had published the results of bacteriological examinations of gut sterilised by different methods. He had concluded that "heat sterilisation properly controlled was the only safe and positive method for sterilising surgical catgut sutures." In a further paper published in December, 1934, he had given results of the examination of 1204 sutures emanating from Great Britain, France, Germany, Japan, and Spain, and had found that 4 of the 8 British brands, 1 of the 4 French brands, 5 of the 6 German brands, 2 of the 4 Spanish brands, and both of the 2 Japanese brands were non-sterile. His tests, however, were tests of *absolute* sterility and could hardly be regarded as practical for every-day control. Prof. T. J. Mackie, of Edinburgh, had found that ethyl alcohol, oil of cloves, oil of eucalyptus, phenol, and lysol had little action on bacterial spores. Formalin was more effective but

acriflavine and crystal-violet brilliant-green mixture were ineffective, and biniodide of mercury failed to kill spores after they had been exposed for 82 days to a 1 : 1000 alcoholic solution. He had confirmed Bulloch's unfavourable report on perchloride of mercury. Silver nitrate had proved lethal to spores, and so had boric acid, but both tended to damage the physical properties of the gut; the same applied to iodine trichloride. He had found iodine water to be effective, again confirming Bulloch's earlier findings. A combined hydrogen peroxide and iodine water method gave a sterile gut with good physical properties. Little was known about the factors which governed the fate of catgut in the living body, but Dr. V. D. Allison's recent work had shown extreme variation in resistance to tryptic digestion in vitro of commercial catgut. Mackie had reached the following conclusions in regard to the presence of *Bacillus tetani* in catgut: (1) the presence of the bacillus in the raw material was irregular and variable; (2) only certain batches of any commercially sterilised catgut might be contaminated; (3) bactericidal processes, even if not entirely effective, might destroy the majority of the spores; (4) survivors might be scanty and irregular in distribution; (5) the thickness and amount of catgut left in the tissues might determine the multiplication of the bacillus; (6) other factors might be involved, including perhaps factors affecting the power of spores to germinate in the tissues.

Certain cases of post-operative tetanus had lately come to the notice of the Ministry, one group from a hospital in the north and another group from a hospital in the south. In the northern group, two cases had followed operations for inguinal hernia, and the patients had recovered; the third, following nephrectomy, had proved fatal. The catgut used was bought raw and sterilised at the hospital by boiling in xylol for half an hour and then storing in spirit. Samples of gut similar to that used at the operations were examined and found to be heavily infected with aerobes and spore-bearing anaerobes, but *B. tetani* was not demonstrated. Some of the dry catgut before sterilisation, however, was found to contain the bacillus. Four cases occurred in the southern group, of which two ended in recovery and two were fatal. Both commercially sterilised catgut and catgut sterilised at the hospital were in use here, but the theatre sister thought it probable that hospital-sterilised gut had been used in the second fatal case, and might well have been used in the others. The method of sterilisation employed was immersion of the gut in oil of cloves for 14 days followed by storage in absolute alcohol for 8 days. Post-mortem material from the second fatal case and specimens of both kinds of catgut were examined, but *B. tetani* could be isolated only from the appendix stump. The tetanus spores might have been present in the patient's intestine and have infected the appendix stump, or she might have acquired her infection from the catgut. It was unlikely, however, that *B. tetani* was present in the bowel of all four of the cases affected, and moreover in two of them the bowel had not been interfered with at operation. The method of sterilisation employed at the hospital had been shown experimentally to be ineffective in killing tetanus spores, and altogether, although proof was lacking, the evidence indicated the conclusion that the infection came from the "home-cured" catgut. He appealed to surgeons to inquire into the methods employed for the sterilisation of the catgut they used at operation.

DISCUSSION

Prof. W. BULLOCH said that biniodide of mercury was perfectly useless. He had infected small hanks of sterilised silk ligatures with *Bacillus ruber* and had placed them in a solution of 1 per cent. biniodide. He had tested this material 40 times over a period of ten years and had obtained a pure culture of the bacilli on every occasion; what they lived on he could not say. He thought there were only two methods of sterilising catgut effectively: either by immersion in iodine solution for eight days or by heat. He believed that tetanus in catgut was a bogy. In 17,420 samples of catgut which he had examined he had never once found tetanus.

Prof. JAMES MCINTOSH said that all surgeons had encountered cases of post-operative tetanus. Tetanus bacilli could be isolated from the wound in such cases; in the last one he had examined, however, no tetanus had been obtained from the wound, but the wood-wool used to pack the splint had been found to be heavily infected with the organism. He thought we had yet to go a long way to prove that catgut was a source of post-operative tetanus infection.

Prof. PAUL FILDES agreed that if too much attention was directed to catgut surgeons might overlook other important sources of tetanic infection. In his work he was often called upon to find the tetanus bacillus in sites where it was present—and he did find them; if he failed to find them elsewhere, therefore, it might count, he thought, as useful evidence that they were absent. And though he had found the bacillus in every one of 40 cases of tetanus he had never once found it in surgical catgut. He described a case of pyonephrosis in which excision of the kidney was followed by tetanus; the wound at post-mortem was swarming with tetanus bacilli, but though he examined 50 reels of catgut of the same brand as that used at the operation he had found no tetanus. In another case the knee-joint was excised for tuberculosis and the leg put up in a plaster splint. Three months later the patient developed tetanus and died. The whole operation area was excised and cultured but no tetanus bacilli were grown; but in the wood-wool used as dressing tetanus spores were found. He was convinced the infection of some slight abrasion from the dressing was responsible for the symptoms. He thought that more cases of post-operative tetanus occurred than were reported, and he hoped that every surgeon who encountered a case would put the facts on record so that they could be properly sifted.

Dr. JOHN BEATTIE said that the impregnation of catgut with silver salts gave a sterile gut with sufficient tensile strength for surgical purposes. This method might, it has been suggested, act merely by encasing the spores in silver, but if they were effectively imprisoned it did not matter whether they were living or not. The smaller hospitals often used unsuitable methods of sterilisation, and these must be replaced by a good method which was both simple and cheap. They could not all afford catgut which was sterilised under rigid conditions. He thought that tetanus in catgut was a bogy only as far as the London Hospital was concerned. Post-operative tetanus and wound infections due to catgut were much commoner at hospitals where catgut was not prepared so efficiently.

Dr. V. D. ALLISON said that he had been using trypsin to digest and soften catgut so that any organisms embedded in it might be induced to grow. He had found catgut digested in this way to be teeming with organisms—staphylococci, streptococci, spores, and vibrios, mostly dead. He had also tried

injecting extracts of catgut into animals and had once got tetanus from a sample of catgut requiring to be sterilised before use, but never from catgut declared to be ready for surgical use. A substitute for catgut was most desirable and a new material made from horseflesh was stated to be sterile, flexible, readily absorbed, and of good tensile strength. It was time new experiments were carried out to decide how long different catgut ligatures took to absorb. The rates of digestion with trypsin were very variable.

Lord HORDER remarked that the bacteriologists did not seem to confirm the responsibility of catgut for post-operative tetanus. Might the same arguments apply to gas-gangrene? He would also like to know to what extent surgical technique was dependent on catgut as against other forms of ligature. Was absorbability the great virtue of catgut determining its use?

Mr. W. M. DICKIE said that three areas where outbreaks of post-operative tetanus had occurred were areas in which heavy grades of catgut were commonly used. Such grades were hard to sterilise and persisted for a long time in the tissues. If the lightest possible catgut was used there was less likelihood, he thought, of getting tetanus.

The CHAIRMAN said that he rarely used catgut unless he was forced. He found that unabsorbable sutures, provided they were thin enough and sterilised just before use, were rarely attended by the disadvantages usually attributed to them.

Mr. CARWARDINE urged all surgeons to prepare their own ligatures and handle them in person until the last minute. He had always sterilised his own catgut by the xylol method, and he had never seen any tetanus.

Sir WELDON, in replying, said that the thesis that tetanus in catgut was a bogy had not been proved. The discussion had shown the need for further research. He trembled to think what would happen if all surgeons prepared their own catgut; not all of them could be trusted to perform the task as carefully and successfully as Mr. Carwardine.

SECTION OF LARYNGOLOGY

A MEETING of this section was held on Feb. 7th, with Mr. LIONEL COLLEDGE, the president, in the chair.

Mr. MAXWELL ELLIS read a paper on the mechanism of the

Bronchial Movements and Naso-pulmonary Reflex

He said that his interest in the subject had first been aroused when he was working in Dr. Chevalier Jackson's bronchoscopic clinic and noticed the movements in the bronchi of certain asthmatics. This led him to an attempt at recording these movements. He briefly described the muscular structure of the bronchial tubes, and pointed out that the muscle extends as a continuous network from the trachea to the air sacs. The fibres run neither circularly nor longitudinally, but obliquely, in "geodesic" lines, as depicted by William Snow Miller, enclosing lozenge-shaped spaces. They end at the mouths of the atria, surrounding these openings almost in the manner of a sphincter. It had been deduced from the structure of the bronchi that they elongate with inspiration, shortening during expiration, but different opinions had been expressed about the nature of the alterations in calibre.

Mr. Ellis said that none of the experimental methods of measuring and recording these movements did this directly. The classical investigations of Dixon and Brodie in 1903 consisted in measuring the changes in volume of a lobe of a lung. By other methods the variations in intrapleural or intratracheal pressures were recorded. It was doubtful whether these measurements were reliable records of variation in intrabronchial capacity, particularly as the experimental animals were in an abnormal condition, and usually kept alive by artificial respiration. Mr. Ellis said that his method of recording changes in calibre in the larger bronchi of the dog was a direct one involving the use of the bronchoscope. A specially devised hollow instrument carrying a rubber balloon which could be inflated through a separate tube was inserted through a bronchoscope into the right bronchus. The balloon was loosely inflated and connected with a Brodie bellows capable of registering clearly changes in volume of one-tenth of a cubic centimetre. Respiratory exchange in the lung distal to the balloon was carried on through the lumen of the instrument and changes in calibre were thus directly recorded. Mr. Ellis showed tracings obtained in this manner, in one of which the bronchial contraction produced by pilocarpine and the relaxation produced by adrenaline were seen. He pointed out that synchronously with the respiratory movements are rhythmic alterations in calibre—inspiratory dilatation and expiratory narrowing—which had been commented upon by Fletcher Ingals and Chevalier Jackson some years ago as a result of their bronchoscopic observations, but not previously recorded by a direct method. The means of production of this rhythm was of interest: (1) it could be produced by impulses travelling in the vagi; (2) it could be an intrinsic property of the bronchial tubes, or (3) a mechanical effect of the respiratory movements of the thoracic walls. The first two hypotheses demand rhythmic contractions of smooth muscle at the rate of at least 15 a minute, and this behaviour of smooth muscle was not seen elsewhere in the body. He showed a tracing from a bronchus before and after bilateral vagotomy in which the bronchus narrowed to an even greater extent after it had been deprived of its constrictor nerve-supply than previously, which seemed to be evidence against the first hypothesis. In numerous experiments the bronchial movements had followed exactly the respiratory movements. Mr. Ellis thought that during the inspiratory phase of respiration the increase in thoracic volume tended to create a decrease in pressure in the lung substance, which in turn caused air to flow into the bronchial tubes, dilating them. The flexible structure of the tubes would permit of this. He considered that the network arrangement of fibres in the myoelastic layer explained how shortening and narrowing of the tubes go hand in hand during the expiratory-phase (decrease in lung volume). He believed that the maintenance of tone is the function of the bronchial muscle.

He went on to discuss the question of peristalsis in the bronchi. Yandell Henderson's work on the "dead space" and its occasional rhythmic variation was the best available evidence about this function and was supported by Lewis's demonstration of contraction waves in tissue-culture preparations of bronchial tubes from chick embryos. In his own experiments Mr. Ellis had never witnessed rhythmic relaxation followed by contraction which would indicate the possible existence of peristalsis, but he had occasionally observed variations in tone. For

a true demonstration of the phenomenon records from two fixed points in a bronchus were necessary, and these had not been obtained. A certain amount of work had been done on the influence on respiration of reflexes from the nose, but nothing convincing had been published on the effects of such reflexes on the bronchi. Mr. Ellis showed tracings of bronchial reactions produced by stimulation of the septum with a moderate faradic current and of the right nasal cavity with dilute ammonia vapour. Bronchial constriction occurred often but not invariably. Such stimuli were stronger than those which occur in normal life and might evoke pain and defence reflexes which obscured the picture; clear-cut results were not easy to obtain. This might perhaps be explained by the different functions of the canine and human nose. The principal function of the former was olfaction, and of the latter respiration, and the microscopic structure of the mucous membranes indicated this difference. The human nose might be more sensitive to stimuli, but he had had no opportunity of carrying out experiments on man and had no objective evidence to offer. On stimulating his own septum with an electric current, he received no subjective sensation of constriction in the chest, but he had no idea how much bronchial constriction was needed to convey such a sensation. He felt convinced, however, that the tone of the bronchial muscle could be influenced reflexly from the nasal mucous membrane, although he was not prepared to be dogmatic as to the precise mechanism. Finally, Mr. Ellis pointed out that it was essential to know more about the normal dynamics of the bronchi in order to understand the abnormal mechanics of asthma and other spasmodic respiratory diseases.

Dr. G. EWART MARTIN mentioned observations that he had made on patients during bronchoscopy. Blowing cold air down the bronchoscope resulted in a closure of the bronchus which relaxed on the introduction of warm air.

Mr. T. A. CLARKE asked whether Mr. Ellis had made any observations on the subject of homolateral reflexes between the nasal cavity and bronchial tree. He had read descriptions of such reflexes.

Mr. H. V. FORSTER mentioned that in some patients in whom the larynx had been excised movements of the diaphragm were unequal on the two sides. He wondered if this affected the lung by promoting unequal bronchial dilatation and, perhaps, lung expansion.

Mr. A. R. TWEEDIE recalled a case where the patient, during the performance of a nasal operation, suddenly went into an asphyxial spasm. He passed a bronchoscope and saw what appeared to be a complete closure of the secondary bronchi by swollen mucosa.

In reply, Mr. ELLIS said that theoretically he would expect the bronchial muscle to react to stimuli applied locally to the overlying mucous membrane. He had not yet investigated this aspect of reflex behaviour. He doubted the validity of the work quoted by Mr. Clarke. On theoretical grounds, as the sensory arc ended in the medulla, spread to both sides was almost inevitable, and both vagal nuclei would almost certainly be affected. He had on several occasions observed effects on the right bronchus resulting from stimulation of the left nasal cavity.

In the case quoted by Mr. Tweedie he thought an extreme form of bronchial muscle spasm had occurred. The bronchial mucous membrane contained no erectile tissue, and did not convey the impression that it could suddenly swell several millimetres. He thought it likely that for some unknown reason the bronchial muscle in this patient was unusually irritable and was reflexly stimulated by the nasal operation to extreme tonic contraction.

A number of cases were exhibited and discussed at some length.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY

AT a meeting of this section on Feb. 6th, with DR. P. MANSON-BAHR, the president, in the chair, Prof. R. T. LEIPER presented a demonstration on the

Crustacea as Helminth Intermediaries

This took the form mainly of lantern slides illustrating the life-histories of the dibothriocephalus tapeworms, the Guinea worm, and *Gnathostoma spinigerum*, all using species of cyclops as intermediate hosts, and the life-history of the lung fluke which uses certain fresh water crabs and crayfish as second intermediaries. He said that the life-history of the guinea worm had been correctly deduced, on the analogy of that of a very different worm in fish, from the close similarity of their embryos. *Gnathostoma spinigerum*, normally parasitic in the stomach wall of cats and dogs, had been found several times subcutaneously in man. The lung fluke, parasitising man and some other mammals in the Far East, and dogs in Venezuela, had recently been reported from a child in West Africa. It was very important that regional collections of crustacea should be made so as to ascertain the distribution of intermediaries, but in that connexion it had to be remembered that the entomostraca were also intermediaries for a number of helminths not parasitising man. Among these were several tapeworms of the same group as dibothriocephalus, some species of the four-suckered tapeworm genus hymenolepis, and many acanthocephala. Caution was therefore needed in interpreting the discovery of helminth larvæ in crustacea.

Dr. B. G. PETERS followed with a paper on some recent

Developments in Helminthology

which dealt with certain biological aspects of parasitism, mainly among the cestodes. Normal life-histories, he said, were occasionally departed from, as when larvæ of *Dibothriocephalus mansoni* or *Mesocestoides*, fed to dogs, continued to live as larvæ in the peritoneum instead of becoming adults in the intestine. De Waele's work tended to show that tapeworm embryos and larvæ resisted intestinal digestion only because the surrounding egg-shell and cyst wall, respectively, protected them from the host's gastric juice. The adult cestodes appeared to have an anaerobic metabolism in which glycogen was decomposed to furnish energy, and fatty acids and carbon dioxide were excreted as metabolic products. So-called "age immunity" in helminths was a form of innate immunity. Acquired immunity could be most fully illustrated from Miller's numerous experiments on the larval stage of the cat tænia. These had revealed active immunity, both natural and artificially induced, and also passive immunity, both inherited and induced. Of immunological reactions employed in diagnosis, the Casoni skin test for hydatid was a group reaction among the tænias. Intradermal and precipitin reactions appeared to have been established as valuable methods for the diagnosis of trichinosis, both in man and in the pig.

Dr. N. HAMILTON FAIRLEY said that most helminthic immunological reactions were of a group nature, probably owing to the existing crude methods of preparing antigens. It was usually easier to detect fixed antibodies, as in skin tests, than free antibodies concerning which there was less knowledge.

Major-General W. P. MACARTHUR said that in cysticercosis the complement-fixation reaction varied in intensity along with eosinophilia; both were high in early stages, then tended to disappear, and finally to reappear with the death of the cysts.

In reply to a question whether, in view of the spread of the "mitten crab" in Europe, some local mollusc might not serve as first intermediary to the lung fluke in place of melania,

Prof. LEIPER said that he thought this unlikely. Trematodes were more specific as to first than as to second intermediaries. Moreover, both the lung fluke itself and the habit of eating raw crab would also have to be introduced before this parasite could spread in Europe.

MIDLAND OBSTETRICAL SOCIETY

A RECENT meeting of this society, held at Birmingham, was devoted to a discussion on

Eclampsia and Pre-eclamptic States

Mr. S. W. MASLEN JONES (Wolverhampton) said that since the Obstetrical Congress of 1922 there had been a general adoption of purely medical treatment in eclampsia as opposed to active obstetrical interference. The essentials in treating eclampsia and pre-eclampsia were similar—namely, (1) rest; (2) starvation, giving nothing but water for 24–48 hours, and then adding fruit juice, carbohydrates, and milk; (3) intestinal lavage and saline purgation; and (4) free intake of alkaline fluids. In eclampsia nursing in the left lateral position was essential, because it allowed escape of blood and mucus from the mouth and air-passages; lavage of stomach and colon should be done as a routine leaving magnesium sulphate in the stomach. In unconscious patients fluid should be given per rectum; if this was returned, intravenous or even submammary salines might be necessary. Fluids should never be "pushed," however, before the bowels were acting freely, since there was a danger of waterlogging the patient. The value of drugs was disputed: morphia in a dose of up to gr. ½ was useful for controlling restlessness during labour, but it often failed to stop fits, and was not entirely safe in cases with pulmonary œdema. Induction of premature labour was not done often enough in eclampsia: if there was no conspicuous improvement in the patient's condition, and no sign of spontaneous onset of labour, after 24 hours' medical treatment labour should be induced by aspiration of liquor amnii with the Drew Smythe catheter. In severe pregnancy toxæmia, without fits, the use of induction called for much discrimination. After the 36th week he advised induction in severe cases which had responded to treatment, whereas before this time medical treatment should be continued unless the patient was getting worse, since the viability of the child was of importance; but in the latter type of case it must be remembered also that intra-uterine death of the child was common.

Mrs. BERTRAM LLOYD agreed that it was dangerous to give too much fluid in the early stages of treatment; she advised induction in cases of pre-eclampsia if medical treatment produced no improvement within three weeks. In her experience eclampsia was rare in hospital cases. At the Birmingham Maternity Hospital there had been 87 cases in the past six years. Delivery was spontaneous in 56 cases; forceps were used in 19; Cæsarean section was done once. In 4 cases labour was induced, and 6 patients died undelivered. The maternal death-rate was 25 per cent. and the fœtal 47 per cent.

Mr. ALFRED DANBY said that as the primary cause of the pre-eclamptic state was still unknown, all forms of treatment for this disease (or syndrome) must be empirical. Recent experimental work in America suggested that some of the untoward symptoms of eclampsia were due to "water intoxication," and he wondered whether this suggestion would have any influence on the fetish for forcing fluids to dilute the "toxins." The three cardinal signs of pre-eclampsia were raised blood pressure, œdema, and albuminuria, of which the last-named was probably the least important. It was now known that water retention could occur without visible œdema, and any undue gain in weight in the last trimester of pregnancy was suggestive of this so-called "hidden œdema." The generally recognised fact that free diuresis was usually followed by rapid improvement in the general condition seemed to indicate a functional rather than organic derangement of the kidneys. In this connexion Mr. Danby was particularly interested in the work of Hoffmann and Anselmino (1931) who were able to demonstrate that the blood of eclamptics contained two components of the posterior lobe hormone—namely, the anti-diuretic and the pressor. These factors were not present in the blood of normal women, pregnant or otherwise. Goodall (1933), commenting on this work, which was done upon rabbits with controls, considered that it showed a consistent uniformity of reaction that placed the antidiuretic content of the blood of these patients beyond doubt; the pressor substance was present only in cases of high blood pressure, 180 systolic or over. It appeared, however, that Hoffmann and Anselmino's observations had not yet been confirmed by other workers. Whilst the physiology and pathology of water metabolism was still imperfectly understood, the speaker felt that it had a considerable bearing on the subject under discussion. During the past few years he had treated a number of cases of pre-eclampsia showing œdema by fluid limitation and dehydration—a method modified from that of Arnold and Fay (1932). The results had been excellent as far as they went, but the cases were specially selected. In many instances the change in the external appearance of the patient and the reduction in weight due to loss of fluids was very striking. Although the diet contained over 50 grammes of protein, including meat, he had seen no ill-effects from its use; but most of the patients complained of thirst. In eclampsia he was convinced that the injections of hypertonic solutions had given improved results, probably through dehydration and diuresis. He usually employed a 25 per cent. solution of glucose intravenously, but occasionally intramuscular injections of 25 per cent. magnesium sulphate were given in addition. The free use of sedatives, including Sodium Luminal hypodermically, were part of the routine treatment, and all forms of interference—such as colon wash-outs, rupture of the membranes, and application of forceps—were done under chloroform anæsthesia. The objection to the use of small quantities of chloroform was in his opinion more

academic than real. As regards Cæsarean section, although he admitted there might be an occasional case where it should be done, he had never had occasion to perform the operation for eclampsia.

Mr. H. L. SHEPHERD said that in Bristol eclampsia was becoming less common; during the past ten years he had seen 80 cases, with 9 deaths, whereas before the war the average was 15 cases per annum. He believed that eclampsia and pre-eclampsia should be treated on different lines; for although the primary toxin was undoubtedly formed in the placenta, the fits were caused by absorption of toxic products from the bowel. The greater number of deaths in eclampsia were due to intracranial hæmorrhage, a direct result of the high blood pressure and the fits. Hence the most important part of the treatment of eclampsia was to reduce the blood pressure and control the fits, which he thought could best be done by free venesection and the use of morphia. Subsequently the usual eliminative treatment of the bowel should be adopted and protein omitted from the diet with the idea of sparing the liver and giving it every chance to recover. He considered it dangerous to allow too much fluid. Pre-eclampsia, he believed, was always associated with constipation, which led to the higher breakdown products of proteins being absorbed unchanged. Constipation should therefore be treated energetically. The value of induction of labour lay mainly in the relief of intra-abdominal pressure; hence the fact that withdrawal of liquor amnii through catheters gave better results than bougies. Calcium, both by mouth and intravenously, was of value at all stages.

Mr. WENTWORTH TAYLOR, speaking of the Dublin method of treatment, said that it did not consist in a fixed and unalterable régime. While the basic principles of Tweedy's treatment were still generally applied, each case was dealt with on its own merits. To some extent he had been impressed with the efficacy of the treatment, and in his personal experience of 62 cases he had only had 9 deaths; in all the fatal cases post-mortem examination had revealed some gross failure of the human organism such as cerebral hæmorrhage or massive necrosis of the liver or kidneys, which no form of treatment could be expected to influence. Pregnancy toxæmia could be classified broadly into four separate types. (1) *Pernicious vomiting* should be treated in the first place by securing a proper action of the bowel and by correcting any malposition of the uterus. If this preliminary attack failed the patient lost weight rapidly, continued to vomit, and developed jaundice and acetonuria. In these circumstances delay was dangerous and the uterus should be emptied by abdominal hysterotomy in the sure knowledge that rapid improvement would follow. Evacuation by insertion of tents was too slow. (2) In the *pre-eclamptic state* starvation need seldom be carried beyond two days and never beyond four. If there was no improvement after this time, labour should be induced. Hysterotomy might be necessary in severe cases before the 25th week. (3) In *eclampsia* he advised an initial dose of morphine gr. $\frac{1}{4}$–$\frac{1}{3}$. If this failed to control the fits a major cerebral lesion was probable, and no further morphia should be given. Venesection was not popular in Dublin, since eclamptic patients were in any case anæmic during the puerperium. Cæsarean section at or near term was never necessary since it was easy to stimulate the uterus to empty. (4) In *toxic antepartum hæmorrhage* treatment by plugging the vagina was seldom attempted now. It was preferable to treat by puncturing the membranes, allowing the waters to escape and the uterine cavity to close down, after which spontaneous delivery was the rule.

Mr. T. C. CLARE (Leicester) was not convinced that toxæmia was the right descriptive term for the condition under discussion. He was now converted to Paramore's mechanical theory of origin of eclampsia. The essential in treatment was to stop the fits. The results published by Stroganoff were so remarkable that he felt that the danger of using chloroform for this purpose was less than generally believed. He personally used spinal anæsthesia to lower the blood pressure, and regarded it as safer than venesection. It could be repeated if necessary. He asked whether Evipan had been tried for control of the fits. He thought that oxygen played an important part in treatment.

Prof. MILES PHILLIPS (Sheffield) said that eclampsia was rare in treated cases. It was important that the honorary surgeon should see cases of pre-eclampsia at least three times in the 24 hours. At Sheffield they had used the Stroganoff method of treatment since 1922. Induction of labour should be done when a pre-eclamptic patient became worse, and it was important to listen to the fœtal heart twice daily. He thought that Veratrone and venesection were both of value, but that it was easy to overdo the administration of fluids. He mentioned that eclampsia was extremely rare in Holland—a fact attributed to the salt-free diet.

Prof. H. J. DREW SMYTHE (Bristol) believed in giving large doses of morphia in eclampsia. He said that a pre-eclamptic required protein to reduce œdema.

Mr. C. L. SOMERVILLE (Leicester) said that in the treatment of eclampsia he advised immediate venesection followed by intravenous anæsthesia, preferably with Pernocton in a dose of from 3–4 c.cm. There was no risk of damage to the liver. The patient slept for 5–7 hours, and was not restless on waking. Fits were rare after this. The effect of evipan was too transient for its use in eclampsia. He believed in giving pilocarpine to produce sweating.

Prof. D. C. RAYNER (Bristol) advised rupture of the membranes as soon as possible in eclampsia. If pilocarpine was used there was a danger of drowning the patient.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 9 new applicants were assisted and 54 grants were renewed. In all the sum of £1680 was voted. The following are particulars of a few cases helped.

Widow, aged 28, of M.B. who died in May, 1935. Both her parents died when she was a child leaving only sufficient money to insure the child's education. In July, 1932, she married, but in May, 1935, the husband died leaving the widow at the age of 28 with two infant children, and a capital sum of £380. The fund and its auxiliary, the Ladies' Guild, will do what is possible to help.

Widow, aged 78, of M.R.C.S. who died in 1890, was found to be living on a yearly income of £66. The fund granted £25 thus raising the income to £91, which is the limit allowed for retaining the State old age pension of £26.

Daughter, aged 37, of M.R.C.S. who died in 1908. After her father's death she was educated from 9 to 15 years at Dr. Barnardo's Home. She then had to earn her own living and went into domestic service. As she is a dwarf she is unable to do any strenuous work and her power of earning is limited. It is estimated that her earnings for the last month at odd jobs was only £2. The fund voted her an allowance of £26.

As this is the centenary year of the fund a special appeal is being made for new subscribers to carry on the work begun a hundred years ago and for donations towards the centenary fund. Cheques should be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

MEDICAL SOCIETY OF LONDON

Prof. G. E. GASK, the president, took the chair at a meeting of this society on Feb. 10th, when a discussion on the

Treatment of Sterility

was opened by Mr. C. S. LANE-ROBERTS. Absolute sterility in the female, he said, could often be corrected nowadays by plastic operations on the adnexa, and one should seldom give up hope of conception. Most couples should be allowed to go on from twelve to eighteen months without investigation unless an obvious cause was present. The investigation at the Meaker clinic for sterility in Boston was amazingly thorough. The team consisted of a urologist, a gynæcologist, an internist, an endocrinologist, and a clinical pathologist. The basic routine study required a full week and consisted of six steps: the medical histories and examinations of husband and wife; the gynæcological history and abdominal examination; examination of the semen; endocrinological studies of husband and wife; transuterine insufflation; and further necessary medical or surgical procedure. Meaker's nine major headings for the causes of sterility were: deficient spermatogenesis; obstruction and occlusion in the male genital tract; hostility of prostato-vesicular secretion; faults of delivery and reception of semen; hostility of endocervical secretions; "uterine blockade"; tubal obstruction and occlusion; impassability of ovario-tubal hiatus; deficient oögenesis. Constitutional disorders impaired fertility, and success might be achieved by combating general debility, endocrine dysfunction, metabolic disturbance, and chronic intoxication. The urological examination must be very thorough, but a well-balanced outlook must be maintained. Perhaps the American workers laid too much stress on endocrine disturbance. In an American series of 4000 cases the large bulk of the males were said to have shown anterior pituitary dysfunction with faulty spermatogenesis, some with thyroid deficiency and some with disturbance of the islets of the pancreas. In some cases of male genital hypoplasia it was claimed that the injection of prolan gave promising results. Many cases of sterility were due to inability to perform the sexual act, and simple and direct advice would often be successful.

On the female side, the sooner an external dyspareunia was dealt with the better. Spasm of the pelvic floor muscles was common, and easily and quickly remediable. It was usually neither necessary nor advisable to perform plastic operations on the vagina. Huehner's work on post-coital examination in cases where intercourse failed to produce cervical insemination had led to the conclusion, among others, that the normal alkaline endocervical mucus was an environment favourable to spermatozoa, and that the acid vaginal moisture was hostile. The significance of premature ejaculation was therefore obvious. Marked anteversion of the cervix, so that the external os was covered by the anterior vaginal wall, often went with hypoplasia, scanty periods, an undersized uterus, an elongated cervix, and a pinhole external os. Chemical hostility of the endocervical secretion and serological hostility were probably not very important, and bacterial hostility might be grossly exaggerated. Excessive viscosity in the cervix might, however, be due to bacteria, and a mechanical viscosity to poor cervical drainage; this could be treated by dilatation and draining for a few days. A douche of dilute hydrogen peroxide or sodium bicarbonate shortly before coitus was useful. Endocervicitis should be thoroughly treated, either by linear cauterisation or by diathermy with the burr or cutting loop. Retention cysts should be dealt with. Curettage of the endocervix and chemical antiseptics seemed quite useless. Chronic passive congestion might be cured by correcting such faults as coital excess or habitual excitation of the female without proper orgasm. The correct treatment of chronic constipation and uterine retrodisplacement also helped. A deficiency of the precoital secretions demanded instruction for the husband. There were only two indications for artificial insemination: imperfect "delivery-reception," and hostile endocervical secretion. Uterine blockade mostly implied the deformity of the uterine cavity or obliteration of the tubal lumen by fibroid tumours. A carefully done myomectomy with meticulous hæmostasis was often followed by pregnancy. The mildest gonorrhœal salpingitis caused damage to the tubal mucosa. Puerperal and post-abortive infections might cause adhesions and occlude the tubal ostia.

Of recent years lipiodol salpingography had been almost universally adopted. Ordinary insufflation methods were of help when the tubes were found closed at laparotomy. The best time for tube testing was immediately after a period, when the epithelium was at its lowest. Only a very chronic case was suitable for salpingostomy. Any proposed plastic operation should be thoroughly explained to the couple. In 366 cases treated by Bethel Solomons with tubal resection, 8 per cent. became pregnant and 18 per cent. either became pregnant or showed tubal pregnancy. Adhesions and folds should be dealt with and a prolapsed ovary might be stitched up. Some workers reported success in cases of sterility with mid-menstrual pain by bursting the follicle under anæsthesia, and others by shaving off the surface of the ovary to facilitate the rupture of the follicle. Small X ray dosage was sometimes used for oögenic dysfunction.

Of the constitutional causes, chronic intoxication should be excluded. The diet should be regulated and vitamin E and protein given. Slimming and obesity would both cause sterility. Lack of exercise, over-work, nervous fatigue, and anæmia could be treated by change of habit and scene.

ENDOCRINE FACTORS

Mr. Lane-Roberts summarised Knaus's work on the physiology of ovulation, but set against Knaus's theory of "safe periods" following and preceding menstruation the results published by Dickinson, who found that impregnation could take place at any part of the cycle, including the period itself. He discussed in some detail the endocrine causes of sterility, in relation to the use of œstrogenic and gonadotropic hormones. Thyroid, he said, might be employed with great advantage, even with a normal basal metabolism. Progestin was remarkably useful in threatened or habitual abortion; in the treatment of sterility it should be given in association with œstrin in the last third of the menstrual cycle in order to prepare a suitable premenstrual nidatory phase. In some cases of primary ovarian failure, 10 units of insulin before breakfast and dinner improved genital function. Out of 150 cases of functional sterility treated by hormones, dilatation and diagnostic curettage, and low-dosage radiation of the pituitary and ovaries, 53 per cent. had become

pregnant and 42 had carried to full term. In the vast majority of cases the infertility factors would be gradually sifted out by general and local physical examination of husband and wife, with appropriate treatment; Huehner's post-coital examination of spermatic fluid; tests for tubal patency; and special measures such as endometrial examination and tests of the basal metabolism.

DISCUSSION

Mr. A. C. PALMER said that by far the commonest cause of sterility in woman was some degree of genital imperfection or under-development, which included acute anteflexion. This displacement could not, of course, stop one spermatozoön, but would stop the fluid which carried the sperm cells, especially if it was abnormally viscous. Salpingitis sometimes did not damage the tubes, but filled the pelvis with adhesions which did not necessarily close the abdominal ostium, and yet somehow by their presence prevented the sperm from reaching the ovary. Their simple removal was sometimes followed by pregnancy. Tiny fibroids or fibromyomata and adenomyomata in the isthmus might block a tube so that gas did not pass at 200 mm. Hg, and laparotomy might be justified. He was working on a technique of cutting out the growth together with a large part of the isthmus, making an incision in the top of the fundus, cutting a big channel in the uterus and embedding the ampullary portion of the tube. This had appeared to lead to patency, but its value had still to be proved.

Mr. V. B. GREEN-ARMYTAGE said that anovular menstruation was a far commoner cause of sterility than was generally appreciated. If a very fine curette were passed just before the period and a cheese-paring were taken from the endometrium at the top of the uterus, hypoplasia would be found with no secretory phase. Out of 7 of his patients treated for the first two weeks after the period with 100,000 units of Œstroform twice a week, and with three doses of 30 rat units of Progynon during the last ten days of the cycle, 4 had become pregnant after three months, one with twins. Greater stress should be laid on the value of lipiodol injections, which apart from their diagnostic value were therapeutic in at least 20 per cent. of cases. This procedure was apt to be neglected in London, to the discredit of London gynæcologists. The insufflation test was more or less useless; he had known clubbed or phimotic tubes to be declared patent on the strength of this test. It was a mistake to use catgut, which was easily absorbed, for uterine implantation; silkworm gut gave far better results.

Dr. WILLIAM MOODIE drew attention to the psychological factors which might cause sterility in apparently normal couples, some maladjustment or imbalance preventing successful coitus. A faulty attitude to sex, the married situation, and life generally explained many such troubles. Mental causes might have actual physiological repercussions, and mental and physiological readjustment must proceed together. A person might be sterile with one partner and fertile with another.

Mr. W. MCK. MCCULLAGH said that he could not understand why lipiodol should pass through a tube if gas could not. Patients surprisingly often became pregnant when their tubes were not patent to ordinary gas. The tubes might open some days after an unsuccessful insufflation. Fear probably had an influence in sterility; a certain veterinary surgeon had owed his great reputation for the successful mating of horses to his practice of thoroughly startling the mare first by chasing her round the yard with a whip. The speaker claimed 48 per cent. of successful results with insufflation in a series of 50. Impregnation might be achieved by stopping the husband's tobacco, ordering a seaside holiday, or giving thyroid and calcium, which latter increased sexual desire in females.

Mr. GREEN-ARMYTAGE answered that Rubin had established that carbon dioxide caused spasm of the tube whereas lipiodol did not; moreover, the gas had therapeutic value in only 10 per cent. of cases as against the 20 per cent. of lipiodol.

Mr. JOHNSTON ABRAHAM suggested that better results might be obtained if the husband was always sent to a urologist. Sterility due to the male was far higher than the 12 per cent. mentioned by Mr. Palmer, and it was easy to see whether a man was fertile or not by semen examination. In a case of double epididymitis, implantation of the vas into the top of the epididymis might cure the sterility. Recent gonorrhœa did not sterilise a man, but chronic prostatitis would thicken the spermatic fluid and impede the action of the spermatozoa. Many men were impotent though quite fertile, and in these cases artificial insemination might be performed.

Dr. HENNING BELFRAGE laid stress on the importance of diet and the necessity of correcting vitamin imbalance, especially in city-dwellers.

Mr. HOPE CARLTON inquired about the incidence of sterility in men after operation for neoplasm of the prostate. If the enlargement was of the whole prostate, he suggested, fertility would probably be destroyed, but an adenomyoma might leave it unimpaired. Young's operation had become popular in America because it was believed not to cause sterility. The closure operation by the Harris technique was said to allow the spermatozoa to pass without being lost in the bladder.

THE FOTHERGILL TESTIMONIAL FUND

THE following is the second list of subscriptions received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th:

Amount previously acknowledged, £262 14*s.* 6*d.*
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Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C. 1.

REVIEWS AND NOTICES OF BOOKS

The Natural History of Disease

By JOHN A. RYLE, M.A., M.D., F.R.C.P., Regius Professor of Physic in the University of Cambridge; Consulting Physician to Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1936. Pp. 438. 15*s*.

To Dr. Ryle's many friends—colleagues, pupils, patients—his new title of Professor must still sound a trifle strange. It carries with it a faint suggestion of intellectual detachment, of academic as distinct from broadly human attitude, which are no part of his character and work as they are known. He has long stood high in the esteem of the English medical world as a general physician—"albeit with an abdominal bias," as he puts it. That is a greater achievement than the industrious ascent of a specialist ladder, and the method and the philosophy that lie behind it are to be gathered from this series of his papers assembled from the medical journals of the past decade. Ten of them, representing the bias, deal with gastro-intestinal subjects, and another score or so with other diseases or symptoms. What do I know about this condition? In what sorts of patients have I met it? In what circumstances? What course does it follow? How precisely can its manifestations be described? What then can I infer about its cause, or its significance, or its later behaviour?

Such questions as these seem to have been the starting point of each essay, and the next step every time was to bring out the writer's own case records and examine them. "Full notes, frequently perused, are the essence of clinical education." There emerges a clinical description, or a discussion of relationships, that is usually simple and direct, yet in some way illuminating, setting matters in a better perspective. The method so exemplified is frankly preached in the opening paper and in one or two at the end of the book. It is the method of the field naturalist, who watches—pencil and note-book in hand—the play and interplay of natural forces and the behaviour of living things. It demands quick and full and accurate observation, immediate and correct recording, and a close examination of the facts in search of sequences and relationships. Dr. Ryle's belief is that this method, old as Hippocrates, is by no means outworn; there are many facts yet to be observed by watching different diseases in different men, and much useful knowledge to be had from studying them. The newer experimental method, applied directly in man to the problems of disease, has its own value and its own field, but the whole future does not lie with it. Medicine, as both art and science, will be not only well practised but also carried forward by the physician with the touch of the naturalist in him, gaining a wide experience and using it wisely and critically. This is sound philosophy. It denies nothing to the experimental method except monopoly. It needs emphasis to-day, not because the experimental method challenges it, but because the development of specialisation, the advent of numerous physical and chemical methods, and commercial enterprise in the therapeutic field have combined to foster in the clinician a neglect of his peculiar opportunity, and a narrow and uncritical attitude.

No one can be in a better position to oppose those tendencies than the professors of medicine, and it is significant that Dr. Ryle, on becoming one of them, should re-emphasise the value in medicine of a broad basis of experience and a closer observation of the natural history of disease.

The Minor Medicine of General Practice

By L. V. SNOWMAN, M.A., M.B. Cantab., M.R.C.P. Lond., Physician to the Eastern Dispensary; Assistant Pædiatrician, Jewish Maternity Hospital. London: John Bale, Sons and Danielsson, Ltd. 1936. Pp. 104. 2*s*. 6*d*.

PATIENT and doctor will continue to disagree about what constitutes minor medicine so long as the former thinks in terms of discomfort and the latter in terms of prognosis. Although Dr. Snowman's little book, despite its title, discusses a number of morbid conditions which will be regarded as minor by neither patient nor doctor, for the most part his comments on their causation and treatment will be found apposite and useful. In the chapter on coryza, though rightly condemning central heating as a predisposing factor, he advocates the use of watery douches in the treatment of nasal obstruction where many nowadays prefer oily sprays. He says, rather surprisingly, that it is rare for a respiratory infection in a well-nourished individual to cause a true bronchitis and omits to mention a rapid pulse as an early, and often solitary, physical sign of phthisis. The point that unexplained pain, labelled faute de mieux rheumatic fibrositis, often turns out to be due to herpes zoster is well taken, and if borne in mind may do much to enhance a doctor's reputation. Dr. Snowman believes that children must be hardened to our inclement weather if rheumatism is to be prevented, and he is eminently sane on the bogy of constipation. In the dietary advised for simple diarrhœa he makes no mention of weak tea, the astringent action of which has much to commend it. In the chapter on cardiac disorders he perhaps lays undue stress on the height of the systolic blood pressure and too little on that of the diastolic, and he claims that the "trained finger" can diagnose hypertension—a debatable point. His remarks on so-called depressor substances are, however, sensible and timely.

Altogether a well-written and sound little book.

Notable British Trials

Trial of Alma Victoria Rattenbury and George Percy Stoner. Edited by F. TENNYSON JESSE. London and Edinburgh: Wm. Hodge and Co. 1935. Pp. 298. 10*s*. 6*d*.

THE sixty-fourth volume in the series of Notable British Trials contains the proceedings against Mrs. Rattenbury and George Stoner for the murder of the former's husband at Bournemouth less than a year ago. The masterly handling of the trial by Mr. Justice Humphreys would alone make the book worth study. If the Court of Criminal Appeal found it merely "a sordid and squalid case," Miss Tennyson Jesse rehabilitates romance in a pleasantly provocative Introduction.

Stoner, aged 18, was engaged as chauffeur by Mrs. Rattenbury, aged 38, and her husband, aged 67. Within two months she gave him a bedroom inside the house and became his lover; within six months her elderly husband was discovered dying with his

head battered in. A doctor, hastily summoned late at night, found Mrs. Rattenbury in a state of drunken excitement, with a gramophone playing and all the lights on. She kept saying she had killed her husband and, when formally charged, said "I did it deliberately and would do it again." She was tried jointly with Stoner on an indictment for murder; she would have been guilty in law if she had counselled or advised the deed even if she had not been present when the blows were struck. She went into the witness-box, denied her guilt without casting any blame on Stoner, and was acquitted. Stoner, who had told the police that he struck the blows, did not go into the box and was found guilty. It was said for him that the Rattenburys were going on a visit, that he was morbidly jealous at the prospect of his mistress resuming marital relations with her husband, and that he hit the husband to give him some hurt which would stop the visit rather than to kill him. It was a hopeless defence. There was also a curiously fugitive suggestion that young Stoner was a cocaine addict, suffering from insane hallucinations. His counsel asked the jury to say Stoner was either "guilty but insane" or else guilty of manslaughter and not of murder. The judge told them he saw no ray of evidence to support insanity. Stoner's counsel had said "he does not deny that it was his hand that struck the blow." As the judge observed, counsel cannot properly make an admission in a criminal case when the client is not put in the box. Three days after Stoner's conviction and her own acquittal, Mrs. Rattenbury committed suicide with remarkable determination, stabbing herself in the breast six times with a knife (three of the wounds penetrated the heart) on the bank of a stream whence her body fell into the water. Stoner's appeal was dismissed, but he was reprieved. Somewhere he is alive, not yet 20, and with his story and his portrait in this book ready to help the public not to forget him when he is free. Is this quite fair?

The Gallic *esprit* of Miss Tennyson Jesse scores several points against our insular prejudices. She derides the Anglo-Saxon attitude of contemptuous condemnation towards the man and woman (and especially the woman) unlucky enough to be found out in sexual delinquency. If Mrs. Rattenbury suffered from nymphomania, the fact was not admirable but neither was it blameworthy. Another Anglo-Saxon trait is attributed to the judge when he stigmatised the husband as a "*mari complaisant*, not a nice character"; Mr. Rattenbury's indifference was "not necessarily a despicable attitude." Worst, and most Anglo-Saxon of all, is the idea that Mrs. Rattenbury, being older, dominated the much younger man. The truth is, says the Introduction, that no woman is so completely dominated by her lover as the elderly mistress of a very young admirer. In support of this thesis Miss Tennyson Jesse prints a singular letter by Benjamin Franklin to a young man on the advantage of choosing an elderly mistress. It is frank enough to bring a blush to the marble of his statues in Philadelphia and other transatlantic towns where the inscriptions credit him neither with cynicism nor with sophistication. The Introduction criticises the reiteration by judge and counsel of the words "adulterous intercourse." The assize court, it reminds us, is a court of law and not of morals. But the law, having to assess the truthfulness of a witness, considers itself entitled to take into account the witness's character. And the prosecution was inviting the jury to consider whether a woman might not be so lost to decency that, to gain her ends and particularly for sexual gratification, she would stop at nothing, not even at murdering her elderly husband—especially if she had not to strike the blow herself. Miss Tennyson Jesse's lively advocacy of Mrs. Rattenbury rebuts the suggestion and makes an interesting study of character.

The Patient and the Weather

By WILLIAM F. PETERSEN, M.D. Vol. I., Part I. The Footprint of Asclepius. Michigan: Edward Bros., Inc. 1935. Pp. 127. $3.75.

THE second and third volumes of this voluminous work have already been reviewed in THE LANCET, when it was stated that there was inevitable delay in producing the first volume. And now that the first volume arrives it is described as Part I., so that the general introduction is not yet complete. What we have now is an interesting essay on Greek medicine with its different approaches to medical problems, while an able summary of Hippocratic arguments leads up to detailed information as to the influence of the weather in relation to particular diseases. here racial differentiation is taken into consideration, although this side has been dealt with in another section. These chapters are profusely illustrated with maps showing the percentage distribution of the "old-age group" (55–75 years) in the United States, and the distribution of this group for the coloured races, the information being obtained from the U.S. census of 1930. Other maps figure the distribution in various States of under-height, underweight, myopia, defective hearing and teeth, mortality of infants from malformation, distribution of various forms of insanity, and suicide rates. The general suggestion in these chapters may be fairly summed up by considering that variations of disease based on environment may be mainly referred to climate and the mutations of weather. One such generalisation may be quoted: "Wherein lies the difference in the European environment and the American? Wherein the energizing effect? What can cause the increase in autonomic dysfunctions? I believe the explanation is a relatively simple one. While it is true that Europe has a typically cyclonic climate, the cyclonic disturbances are neither as frequent nor as violent as those in America. In Europe the rate of travel of the storms is only about half that of the speed that they attain in America. Very rarely does the degree of barometric fluctuation reach the amplitude that we find so common along our storm tracks. It is the abruptness of the autonomic adaptation demanded by these changes that is of greatest moment."

The completion of Vol. I. has still to appear, and it is not quite clear in how many parts that will be issued. So no attempt can be made to estimate definitely the value of this large and far-reaching production until the remainder comes under review. It seems likely that part two of Vol. I., announced as shortly forthcoming, may not prove the conclusion of the work. Enough has been published to show that Dr. Petersen is supplying the medical profession, and the public, with a compendium which must prove a useful book of reference. The second and third volumes were reproduced by lithoprinting so that a considerable saving of expense was brought about. In the first volume the ordinary method of production has been followed, and both the type and the definition of the illustrations may be commended.

REPORT OF THE DEPARTMENTAL COMMITTEE ON CORONERS

THE departmental committee appointed by the Home Secretary in February, 1935, to inquire into the law and practice relating to coroners, and to recommend what changes are desirable and practicable, has brought in its report (H.M. Stationery Office. Cmd. 5070. 1*s.* 3*d.*). The committee was made up of Lord Wright (chairman), Sir Archibald Bodkin, Sir Farquhar Buzzard, M.D., Mr. Digby Cotes-Preedy, K.C., Sir Arthur Hazlerigg, Mr. George A. Isaacs, Mr. W. Rutley Mowll, Mrs. Margaret Wintringham, with Mr. A. Johnston, of the Home Office (secretary). The committee held 19 meetings and examined 68 witnesses. Its main recommendations are summarised for reference as follows :—

The office of coroner should be retained, the coroner's jurisdiction being limited to the investigation of the facts how, when, and where the death occurred and this investigation of facts being clearly distinguished from any trial of liability, whether civil or criminal.

In cases of suicide the press should be prohibited from publishing an account of the proceedings at the inquest ; though the inquest should be held in public, as at present. All that the press should be allowed to publish is the fact that an inquest has been held, the name and address of the deceased, and the verdict that the deceased died by his own hand.

The verdict of *felo de se* should be abolished, and the verdict in cases of suicide should simply be that the deceased died by his own hand.

No inquiry into the state of mind of the deceased should be made in cases of suicide save in so far as it might throw light on the question whether he took his own life, and no reference should be made in the verdict to the state of mind of the deceased.

The coroner should no longer have the power to commit any person for trial on the inquisition on a charge of murder, manslaughter, or infanticide ; and the inquisition should not name any person as guilty of one of these offences.

In any case in which questions of criminality are involved the laws of evidence should be observed ; and where a person is suspected of causing the death he should not be called and put on oath unless he so desires, and should not be cross-examined.

A coroner should be obliged to adjourn an inquest for 14 days, if requested to do so by a chief officer of police on the ground that he is investigating the circumstances of the death to determine whether he should proceed for an indictable offence ; and the inquest should be adjourned for further periods of 14 days if the chief officer of police repeats his request.

Coroners' courts should be prohibited from dealing with questions of civil liability.

Verdicts, or riders to verdicts, of censure or exoneration should be prohibited, but this prohibition should not extend to recommendations of a general character designed to prevent further fatalities.

The coroner should have a discretion to dispense with the holding of an inquest in the case of deaths due to simple accidents, or to chronic alcoholism, and likewise in the case of deaths under an anæsthetic or during an operation. He should be obliged to hold an inquest in cases of suspected industrial disease.

Arrangements should be made to ensure that post-mortem examinations in cases of deaths due to anæsthetics are carried out expeditiously.

Post-mortem examinations ordered by coroners should, save in exceptional cases, be made by pathologists whose names appear on a list to be kept by the Home Office. In compiling the list, the Home Secretary would be advised by an expert advisory committee. There should be a special list of pathologists competent to conduct post-mortem examinations in certain cases of industrial disease.

The coroner, if so requested by a chief officer of police before the conclusion of an inquest, should direct a post-mortem examination to be made. If an inquest is not being held, or an inquest has been concluded, the chief officer of police should have power to order a post-mortem examination subject to the approval of the Director of Public Prosecutions

Steps should be taken to secure the provision of better mortuaries and of places for post-mortem examinations.

A Rules Committee should be established to make rules for the conduct of inquests and the procedure to be followed by coroners generally. The committee should consist of persons appointed to represent the Lord Chancellor, the Home Secretary, Coroners Society, General Council of the Bar, Law Society, British Medical Association, and general public.

A Disciplinary Committee, similarly constituted, should be created to deal with complaints about the conduct of coroners.

Coroners should give, where practicable, reasonable notice of the time and place of inquests, especially in cases of industrial disease.

The coroner should have a discretion to view or not to view the body.

The London County Council should be empowered to prepare a scheme for the approval of the Home Secretary, setting out the areas to be served by each coroner's court provided by the council.

The provisions of Section 84 of the Coal Mines Act, 1911, in regard to the notification of inquests and representation of interested parties, should be extended to all industrial cases.

Coroners should keep adequate records of the evidence taken before them at inquests, and copies should be available to any person who shows proper cause on payment of a fee.

In these cases in which the coroner has at present a discretion to dispense with a jury, he should in future sit without a jury, unless there are reasons which appear to him to render the presence of a jury desirable.

In jury cases the coroner should be empowered to hold a preliminary sitting of the inquest where desirable without the presence of a jury, for the purpose of receiving evidence of identification and issuing a burial order.

Juries should be drawn from the jury list and, where a jury is empanelled in an inquest on a woman, child, or infant, at least two women should serve on the jury.

Steps should be taken, whenever practicable, to merge the smaller coroners' jurisdictions in larger areas.

In future, only solicitors or barristers should be appointed as coroners, but, whenever possible, they should have had experience as deputy coroners and should have a knowledge of forensic medicine.

Coroners should not act in their professional capacity as solicitors in matters which have been the subject of investigation at inquests held by them as coroners.

Deputy coroners and assistant deputy coroners should be appointed and paid by the same authority as appoints the coroner, after consultation with the coroner to whom the deputy is being appointed.

A coroner's officer should in all cases be a serving police officer.

Legislation will be required to give effect to most of these recommendations. The report is signed by all the members of the committee except Mr. Mowll, who submits a minority report. Sir Archibald Bodkin signs subject to reservations set out in a memorandum. Comment is made in a leading article on p. 377.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 15, 1936

THE FUTURE OF THE CORONER

UNANIMITY is a cardinal virtue in a Royal Commission or Departmental Committee. The Committee on Coroners is unanimous on one point only—namely, that the abolition of the coronership is neither practicable nor desirable. It has examined the Scottish system of private investigation of unnatural deaths by the procurator fiscal and does not find its adaptation to England to be feasible. The reason is that the procurator fiscal's inquiries in Scotland are part of his ordinary duties in the prosecution of criminal offenders on behalf of the Crown. As has been pointed out in these columns, there is no such exclusively official scheme of prosecution in England where the proportion of indictable offences undertaken by the Director of Public Prosecutions is much less than one per cent. of the total. The conclusions of the Committee's report (Cmd. 5070. H.M. Stationery Office. 1*s.* 3*d.*) are printed on another page. Some of them, as we shall see, involve fresh legislation. But it is noteworthy that one experienced legal member of the Committee, Mr. W. RUTLEY MOWLL, found himself unable to sign his colleagues' report, while Sir ARCHIBALD BODKIN, who speaks with almost unique authority on the administration of the criminal law, signs it subject to weighty comments and reservations. It may well be, therefore, that a Coroners (Amendment) Bill will not be introduced immediately.

Several of the current complaints of coroners' practice and procedure, declared by the Committee to be well founded, are criticisms which the more judicious coroners escape. They are points in which the high level of the best of these tribunals could be uniformly attained by all if attention were drawn by Home Office circular to what needs to be avoided. Coroners ought to know, for instance, that the law courts condemn the employment of the same persons as jurors at inquests again and again. The decision in R. *v.* Divine, ex parte Walton in 1930[1] left no doubt about this; yet the Committee is told of a town where the coroner's jury regularly consists of the inmates of the workhouse. Such a practice is a scandal; the Committee recommends legislation to secure that inquest jurors be chosen from the ordinary jury list and that at least two women jurors be summoned where the inquest concerns a woman, child, or infant. Another indefensible impropriety is the making of irrelevant animadversions upon the conduct of persons who are in any way brought before the tribunal. The Committee cites an inquest upon a girl of 19 who was said to have had sexual relations with a much older married man. Medical evidence entirely disproved an allegation that he had been responsible for her death; yet the coroner, at the request of the jury, went outside his province and censured the man for his relations with the deceased. Other coroners, the Committee says, use their public position to attack the beliefs held by Christian Scientists or to criticise the administration of a hospital, the status and competence of its medical staff, and the specific method of a patient's treatment. Thus an individual finds himself condemned without redress or right of appeal. The Committee insists that this practice must stop. It desires also to prohibit coroners' juries from bringing in riders imputing responsibility (even where moral blame is disclosed) or purporting to exonerate. The only permissible riders, it insists, are those which contain proposals for limiting the recurrence of fatalities. Interested parties are all too fond of turning an inquest into a skirmish over civil liability, groping for admissions which may later be useful in the county court or High Court and wasting time over minor allegations of negligence which are outside the plain issue before the coroner. The purpose of an inquest is, after all, made clear by Section 4 of the Act of 1887. The inquisition is to elucidate three matters—first, the identity of the deceased; secondly, how, when, and where he came by his death; and thirdly, if he came by his death by murder or manslaughter, the persons (if any) whom the jury find to have been guilty.

Hitherto we have mentioned criticisms which, if all coroners had been blessed with the wisdom of Solomon, no Committee need have been constituted to meet. We come now to the Committee's proposals for altering the law in directions where the best of coroners could take no step unless Parliament first decides the policy. The Committee recommends that the third of the above-mentioned statutory purposes of an inquest be cancelled, that the inquisition should no longer name anyone as guilty of murder, manslaughter, or infanticide, and that the coroner should no longer have power to commit persons for trial. If questions of criminality arise, the laws of evidence are to be observed; if a person is suspected of having caused the death, he is not to be called and put on oath unless he so desires, and he is not to be cross-examined. Already, under Section 20 of the Act of 1926, inquests are adjourned as soon as criminal proceedings are launched before the magistrates. It is unnecessary and inconvenient to have two concurrent investigations, and the coroner stands aside when the ordinary procedures of prosecuting an offender are definitely taken. In future, the Committee proposes, the coroner will adjourn at the request of the police on their mere assurance that prosecution is possible. The coroner is also to direct a post-mortem examination, if the police so desire, before an inquest is ended. If an inquest is not held, or if it is already over, the police are to have power to order a post-mortem examination subject to the approval of the Director of Public Prosecutions. These proposals are evidently based

[1] THE LANCET, 1930, i., 426.

on two ideas—the unfairness of a coroner plying a suspect with questions, and the uselessness of the inquest as an aid to the police in the detection of offenders. On this latter point the experts differ. The majority report of the Committee assumes that the inquest can contribute little, even in poisoning cases. A witness from Scotland Yard declared that the private questioning by the police of possible witnesses or possible suspects was more likely to elicit information than the proceedings at an inquest. Moreover, witnesses who represented the police forces outside London disclaimed any desire to use inquests as a means of extracting incriminating information. But there may still be old-fashioned folk who fear that private questionings by the police can be as grave an abuse as public interrogations by a coroner. Sir ARCHIBALD BODKIN points out that, if essential witnesses refuse to disclose their knowledge to the police, and if there is consequently not enough evidence to justify an arrest, the present system of the inquest is the only other method of compelling disclosure. He regards the coroner's powers in such cases as valuable adjuncts to the present administration of the criminal law.

There will probably be less controversy over the Committee's recommendations as to cases of suicide. Until modern times the law lagged behind the public intelligence. It dealt with self-murder (felo de se) by forfeiting the dead man's goods to the Crown and by burying his body at the cross-roads without religious ceremony and with marks of infamy in order to mark the ecclesiastical condemnation of his offence. The verdict of unsound mind became popular to mitigate these harsh consequences. It has outlived the conditions which were thought to justify it, and, if it were taken seriously, it would confuse the national statistics of crime and insanity. If the law applied to suicides the same tests of criminal responsibility as are insisted upon in the criminal courts, few persons who have taken their own lives would be found of unsound mind. To remedy this curious convention of insanity at inquests, the Committee boldly proposes (as did the Chalmers Committee on Coroners in 1910) to abolish the verdict of felo de se in the coroner's court; it will no longer be his duty to attribute felonious responsibility; the verdict will simply be that the deceased died by his own hand. Further, to prevent the imitative suicide and the publicity which relatives must find so painful, the press is to be prohibited from giving an account of inquests on suicides. The inquest is still to be held in public but the newspapers are to publish only the fact of the holding of the inquest, the name and address of the deceased, and the bare verdict that he died by his own hand. This will involve legislation on the lines of the Judicial Proceedings (Regulation of Reports) Act, 1926, which was passed to suppress unsavoury details, especially in divorce cases. The proposal will encounter not only the opposition of the journalists but also the practical difficulty of the coroner, who cannot announce that the case is one of suicide until the verdict is returned. The Committee suggests that he should state at the outset that a verdict of suicide is possible, whereupon the press would be forbidden to publish any account till the verdict was ascertained. If the law eliminates from inquest verdicts all reference to the deceased's state of mind in cases of suicide, coroners will no longer need to read in court letters and other intimate documents written by him which are often painful and harmful to living persons. It may still be necessary to inquire into the state of a dead person's mind in order to decide whether he took his own life; suicide may still remain self-murder in law; but a great reform will have been achieved if the Committee's proposal receives effect.

Other recommendations are important to the medical profession. It is proposed that post-mortem examinations, ordered by coroners, be made by pathologists whose names are on a national panel constituted by the Home Office with the guidance of an expert advisory committee. A special panel would be available for cases of industrial disease, and it is suggested that the Coroners Acts be amended to include among unnatural deaths any death believed due to illness or disease (including poisoning by gas, vapour, or fumes) resulting from the nature of an employee's work. In recognition of the higher standard required of pathologists on the Home Office panels it is proposed that the post-mortem fee be raised from two to three guineas and that travelling expenses and a fee for attendance at the inquest be allowed. At the same time it is suggested that the ordinary medical attendant of the deceased should be entitled to an appropriate fee for supplying a report on the case or attending an examination. It is often important to collate the clinical and the post-mortem evidence. A further recommendation that better provision be made for mortuaries and places for post-mortem examinations was long overdue. A few important miscellaneous recommendations remain to be mentioned. It is proposed that the coroner should have discretion to dispense with an inquest where deaths are due to what the Canadian laws call "mere accident or mischance," or to chronic alcoholism or where death occurs under an anæsthetic or during an operation. It has long been a matter of comment that in one coroner's district a major operation resulting in death becomes the subject of an inquest, while in another district a similar case is not even investigated by the coroner. Some coroners hold inquests only where death actually occurs on the operating-table, others whenever death occurs before the patient regains consciousness. The previous Committee, which reported in 1910, recommended that all deaths under an anæsthetic should be reported to the coroner, that he should have a discretion as to holding an inquest, and that the hospital or other public institution concerned should hold a scientific investigation. The Minister of Health took up this proposal in 1920, but it has been difficult for hospitals to take action inasmuch as the dead body comes under the control of the coroner.

Lastly, we come to the proposals affecting the

coroner's office. The recent report does not press for whole-time coroners, but it has embodied the suggestions of the Bar Council to the effect that in future only barristers or solicitors should be appointed. It is doubtful whether there is any public demand for this limitation. The inquest in South Dorset on Mr. JEFFERYS ALLEN, an old gentleman of 86 who was found dead with his head against a coal fire, is singled out for prolonged comment by the Committee and indeed is possibly the cause of the Departmental Committee having been constituted a year ago. That inquest was not held by a medical coroner. There are at present in England 268 coroners who are barristers or solicitors, 37 who are medical practitioners, and 4 who have no professional qualifications at all. While it is proposed to eliminate the medical coroner here, it is worth noting that in New York the coroner has been replaced by medical examiners who, since 1918, have sole charge of the medical investigation of sudden, violent, and suspicious deaths. Doubtless in England the influence of the Lord Chancellor makes for a preference for legal coroners. This legal influence it is now proposed to extend by giving the Lord Chancellor fresh powers of removing unfit coroners and by creating two new committees. A Rules Committee is to make rules for procedure at inquests. Naturally much will depend on the nature of the rules. A power to make rules was given to the Lord Chancellor by the 1926 Act and he has made little use of it. The second committee is to be a Disciplinary Committee, apparently on the lines of the tribunal which, under the Solicitors Acts, takes up the grievances of clients and enforces standards of professional conduct. Coroners will be haled before this body for censure. There is no such tribunal where members of the public can obtain redress when annoyed by the behaviour of judges, recorders, or magistrates. If the coroner is worth keeping at all, he should remain as an independent judicial officer who can do his work fearlessly without the risk of being harassed by disgruntled witnesses or unsuccessful advocates.

SALT AND THE SUN

IT is difficult for the European to understand the prominence given to salt in the phrase and fable of the East. Here, where its lack is improbable, it ranks merely as one, perhaps the highest, among the condiments: there, it is one of life's necessities; the salt of the earth is second only to the water of life—indeed, the gods, in Egypt for example, have been worshipped as "givers of bread and salt." With animals it is of even greater importance; big game can be induced to forsake an ancient drinking pool simply by moving a block of rock salt, and no herd of cattle is without its licking-stone. In temperate climates this need for salt is not apparent because there is ample in the food to balance excretion. In the tropics, however, its value is shown when it is realised that in the least oppressive circumstances a man may lose by sweating alone as much salt as he normally absorbs from his diet. The average volume of sweat in the hot weather in India is seven litres a day, containing about 20 g. of sodium chloride, and this is the amount in the normal diet; as the daily requirements in these circumstances are at least 32 g. there is a considerable deficit to be supplied by the tissues. It was to this that, in a letter to our columns,[1] Lieut.-Colonel O. R. MCEWEN attributed the vague ill-health and loss of efficiency so common in the white inhabitants of hot countries. Though differing in degree, this state is similar to that giving rise to the severe miner's cramp described by Prof. K. N. Moss, when the fluid lost by excessive sweating is replaced only by water. Referring to Colonel MCEWEN'S theory, Sir WALTER LANGDON-BROWN later drew attention [2] to another and severer form of the condition in the tropics known as functional hypo-adrenalism. He compared it with Addison's disease which is very similar in its great salt excretion, its symptoms of asthenia, lassitude, insomnia, anorexia, and achlorhydria, and its response to sodium chloride. He thought that this knowledge should diminish the zest with which salt-free diets were often prescribed, especially in asthenic states. The effects of a severe deficiency of sodium chloride were described on Jan. 30th at the Royal Society. Dr. R. A. MCCANCE had given a diet with the least possible sodium chloride, collecting all the excretions and estimating the sodium in the body. Fluids were not restricted and the low protein was augmented by "ashless" casein. It was found that there was a deficiency of 25–35 per cent. of the body sodium, with symptoms of weakness, fatigue, and muscular cramps; the blood showed a rise in the cell count, viscosity, hæmoglobin, protein, and urea. Health was regained when sodium chloride was restored to the diet. This action does not seem to be purely that of any electrolyte, for E. H. DERRICK found [3] that ammonium chloride was ineffective in relieving miner's cramp; the sodium is at least as important as the chloride. These observations show that a large proportion of the indefinite, if not the serious, effects of torrid climates can be avoided, with the intelligent coöperation of the cook, by greatly increasing the salt intake.

The growth of industry and settlement in the tropics has made the whole subject of the effects of great heat one of increasing importance, but as usual ignorance of their nature is betrayed by the confusion in nomenclature. The different types are vaguely and variously called heat prostration, heat exhaustion, heat-stroke, sunstroke, and miner's, stoker's, and fireman's cramp, though the clinical syndromes themselves may be well defined, and there is no better inclusive title than "the effects of heat." The prevention of these is simple, but inventive science seems to have stopped short at punkahs, long drinks, and short shifts. Climate is treated with the same casual tolerance shown to the other states dismissed as being beyond man's control, and even in the last decade the construction of refrigerated offices in Calcutta suffered the editorial scorn of a London newspaper.

[1] THE LANCET, 1935, i., 1015. [2] Ibid., p. 1069. [3] Ibid., p. 38.

The human body, however, can adapt itself to conditions with great extremes of temperature, from exploring the Poles to mining in the tropics; it is only when mechanisms fail, which in ordinary emergencies are enough to protect the organism, that illness occurs. Almost always this is due to purely physical changes in the internal fluids, CLAUDE BERNARD'S milieu intérieur, upon the delicate adjustment of which depends the life of every cell. LEE [4] has divided the effects of heat into four groups: heat cramps, dehydration, heat-stroke in the nervous system, and heat exhaustion in the circulatory; the first two are due directly to changes in the water-salt balance, and the others to the high temperature. Experiments upon miners on the Rand [5] and in the Urals [6] have shown that the great majority of casualties can be prevented by carefully estimating the heat tolerance of recruits and then by acclimatising them with graded work. By such simple measures as good ventilation, light clothing, suitable drinking fluids, and careful training, this type of disease can be limited until it becomes merely the penalty for negligence, instead of a danger to a large part of the population at home and abroad.

[4] Lee, Douglas H. K.: Trans. Roy. Soc. Trop. Med. and Hyg., 1935, xxix., 7.

[5] Dreosti, A. O.: Proc. Transvaal Mine Med. Officers' Assoc., 1934, xiii., 32.

[6] Starkov, P. M., and Jikesh, J. V.: Jour. Indust. Hyg., 1935, xvii., 247.

ANNOTATIONS

PURIFICATION OF THE HÆMOPOIETIC FACTOR

PROGRESS towards identification of the hæmopoietic (blood-forming) substances in liver has been curiously slow and discouraging. There are two reasons for the delay: first, experience has shown that most of the chemical methods which would otherwise be appropriate result in inactivation of the product; secondly, it is hard to find suitable clinical cases for testing the activity of isolated extracts. Lately, however, there has been an outburst of successful activity in widely scattered laboratories. Dakin and West in New York last year prepared a substance, to which the name Anahæmin has been given, which appeared capable of inducing a remission when given in doses as small as 80 mg. A few weeks later Strandell and his colleagues in Sweden reported that they had been able to obtain from 100 g. of liver a substance so highly purified that 2 mg. would induce a remission. Two papers published in our present issue record the further progress made in this country, and our readers will agree that the Medical Research Council has performed a useful service in supporting these investigations and in arranging for anahæmin to be submitted to clinical trial under the supervision of acknowledged experts working in conditions which permit of exact control. Prof. Davidson, Dr. Ungley, and Prof. Wayne emphasise the difficulty of assessing potency in tests limited to a small number of cases, but are able to conclude that anahæmin is highly active for blood regeneration; indeed, in their experience no other liver extract given in such small amounts has produced such striking results. Preliminary observations indicate also that this highly purified fraction may prove to be equally potent in the treatment of the nervous manifestations. The English preparation seems rather less active than the original fraction described by Dakin and West, since 80–150 mg. of the latter usually induced a maximal response, whereas the observations of Ungley and his colleagues suggest that only rarely is an average dose of 359 mg. maximally effective. Dr. J. F. Wilkinson likewise confirms the value of the new methods of fractionation introduced by Dakin and West; he found that 58–120 mg. of a fraction similarly prepared were maximally effective. But he has carried purification even further, and gets maximal responses with total doses of only 18–36 mg., representing an original amount of 660–1332 g. of fresh liver. Further analysis of the chemical nature of this fraction will be eagerly awaited.

Though treatment with the less highly purified preparations already available for parenteral injection is extremely satisfactory if properly carried out, these recent attempts to purify the effective principle are of great theoretical importance; for it is only when the chemical constitution of the effective principles in liver and stomach are known that the complex relationship of these substances will be understood. Castle's original hypothesis that the effective factor in liver is formed by the action of an extrinsic factor (present in beef muscle) with an intrinsic factor in gastric juice has recently been questioned, and an alternative explanation of the observed experimental results is put forward by Greenspon,[1] who suggests, on the strength of experiments at present rather incompletely reported, that it is unnecessary to assume the existence of any extrinsic factor at all. He believes that the hæmopoietic factor in gastric juice is normally inactivated by pepsin; the beef (or other source of extrinsic factor), when incubated with normal gastric juice, binds pepsin and prevents it from inactivating the anti-anæmic principle, but does not provide any other essential principle. The arguments and experiments with which this suggestion is supported are stimulating, but they leave many important points which are more adequately explained by Castle's hypothesis. The answer to these important theoretical problems lies in the hands of the chemists, working in close collaboration with the clinicians, as has been done in carrying out the work reported in our columns to-day.

EXPERIMENTAL HYPERTENSION

THE repercussions of renal disease upon the cardio-vascular system are still a subject of lively debate. On the one hand is the incontestable supervention of arterial hypertrophy and persistent high blood pressure upon a primary Bright's disease. On the other hand is the fact that experimental ablation of one or both kidneys has, on the whole, demonstrated that mere reduction of renal tissue will not of itself initiate a rise of blood pressure, though there is reason to believe that gradual reduction of renal tissue, either by excision or by ligaturing vessels, will lead to a rise of pressure when the borderline of the amount of tissue necessary for life is approached. Puzzling and apparently irreconcilable is the occasional finding, in children, of an advanced stage of chronic

[1] Greenspon, E. A.: Jour. Amer. Med. Assoc., January, 1936, p. 266.

Bright's disease without accompanying cardiovascular hypertrophy.

The present impracticability of reproducing in animals a nephritis comparable with Bright's disease in man may be responsible for most of the negative results of attempts to establish an experimental hypertension by means of known irritants. Considerable interest therefore attaches to the claim of Dr. W. M. Arnott and Dr. R. J. Kellar,[1] working in Edinburgh, to have produced hypertension in rabbits by intravenous injection of sodium oxalate. The difficulty of estimating the blood pressure was overcome by a modification of Van Leersum's technique, in which a loop of the carotid is brought to the surface and enclosed in a tubular strip of skin. It is noteworthy that the observed rise of pressure, which appears to be statistically significant, was not maintained for longer than twelve days after which there was "a pronounced instability." Further experiments[2] were carried out by the same workers on a large series of rabbits in order to elucidate the mechanism of the hypertension. They found that the blood pressure tended to fall after bilateral nephrectomy, and that administration of oxalate to such animals shortened the survival period but did not influence the level of the blood pressure. When one kidney only was removed the usual hypertensive response was obtained with oxalate. Arnott and Kellar therefore concluded that the hypertension was of renal origin. Their view was strongly supported by a further experiment, on a series of 18 animals, in which one kidney was removed and the other denervated. Thirteen animals survived and were then given a course of oxalate injections; no hypertension was observed. The inference from this is that the mechanism of oxalate hypertension in rabbits is of the nature of a nervous reflex. In attempting to assess the importance of these observations it should not be forgotten, first, that oxalate nephritis is essentially a tubular nephritis without demonstrable lesions in the glomeruli; secondly, that the hypertension produced by these experiments appears to be of short duration. In these respects there is a wide gulf between this experimental condition and the nephritic hypertension of man, but the demonstration of a nervous mechanism in any form of hypertension is a progressive step.

OXYGEN DEBT AND CHEST MOVEMENT

IN the search for methods of assessing the efficiency of the respiratory apparatus more than one worker has attempted to arrive at some way of using oxygen consumption under fixed conditions as an easily measured test for respiratory efficiency. The use of "oxygen debt" as such a test has certain superficial attractions and, according to a preliminary account[3] by H. C. Jacobaeus, G. Nylin, and B. Almberg, may be of some value. Oxygen debt is defined as the amount of oxygen used after cessation of a period of exercise in excess of the resting oxygen utilisation for the same length of time and, although the mechanism is by no means simple, this phenomenon is closely related to lactic acid formation during the exercise. Nylin already claims to have shown that, with a measured amount of work, patients with heart disease have an increased oxygen debt when cardiac failure occurs. In the present study patients suffering from pulmonary disorders, especially advanced silicosis, were found to have values for oxygen debt in excess of expectation. It was decided to see whether this finding could be connected with diminished movements of the chest wall, and a series of ten subjects were examined with and without constriction of the thorax by means of a stiff belt. This had the effect of reducing an average vital capacity of 4·5 litres to 2·4 litres. The effect of the belt was reflected in the oxygen debt which was always materially increased, in certain instances resembling the type of increase found in severe heart failure. The authors conclude that the mobility of the thorax plays a more important part in the cardio-respiratory functions than had been hitherto accepted. Further investigation which is in progress might well include a study of what is happening in the blood as regards lactic acid and carbon dioxide. The depletion of bicarbonate during exercise has to be made good and interference with respiratory movements must affect the amount of carbon dioxide blown off as well as the oxygen taken in. The links between movements of the thorax and the chemistry of muscular exercise are many, and a wide survey will be needed before it can be assumed that oxygen debt affords a simple test of cardiac or pulmonary efficiency.

[1] Brit. Jour. Exp. Path., 1935, xvi., 265.
[2] Jour. Path. and Bact., January, 1936, p. 141.
[3] Acta med. Scand., 1935, lxxxvi., 455.

EPIDEMIOLOGY OF TUBERCULOSIS

THERE are still some who believe that adult tuberculosis is due to the reawakening of a focus acquired in childhood, and perhaps more who do not admit that the disease is infectious, at all events to a degree which should forbid the association of a patient with other individuals under ordinary conditions of living. Anyone entertaining these beliefs will have them severely shaken if he studies a series of papers recently published[1] by F. M. McPhedran and E. L. Opie, which record the latest results of a study of tuberculosis, with the earlier stages of which many of our readers are familiar. These authors have for years past observed tuberculosis in a large section of Philadelphia, not merely as it affects individuals, but as it attacks families, and their chief conclusion may best be stated in their own words. "The spread of tuberculosis occurs in large part by long drawn-out family or household epidemics, in which the disease is slowly transmitted from one generation to the next."

The evidence on which this statement is based is voluminous, detailed, and closely analysed. The criteria used to determine the existence of the infection are the intradermal tuberculin test, the skiagram, and clinical examination. For purposes of deduction, families are divided into those in which a member has tubercle bacilli in the sputum, those including a member with tuberculosis but without discoverable bacilli in the sputum, and those with no known contact with the disease. The frequency of a positive tuberculin reaction during early years, and of manifest tuberculosis both then and in later years is, in different degrees and at different ages, unmistakably or even overwhelmingly greater in the first two of these categories than the last. It is to be inferred that the absence of tubercle bacilli from the sputum on such occasions as those when it was examined does not mean that they had at no time been present. Findings of this kind have been recorded before; we may recall a report[2] edited by Dr. G. Lissant Cox on the fate of young children in tuberculous households of Lancashire. What is perhaps more interesting and more contro-

[1] Amer. Jour. Hyg., 1935, xxii., 539, 565, 644.
[2] See THE LANCET, 1920, i., 1201.

versial is the argument used to sustain the thesis that pulmonary tuberculosis in the adult is acquired by recent contact, and does not result from the renewed activity of a focus acquired in childhood. Among the ingenious methods of analysis and presentation by which the authors' extensive data are utilised to this end is the unusual device of the three-dimensional diagram. The whole argument is incapable of condensation, but one item of evidence can be stated quite briefly: it is that among individuals exposed to infection for the first time after 15 years of age nearly 10 per cent. develop manifest tuberculosis, a frequency exceeding that in the general population to much the same extent as that among child contacts in contrast with the children of healthy families. Throughout these studies a clear distinction is drawn between findings in whites and negroes; the different behaviour of the disease in coloured races is hence no reason for refusing to apply their conclusions to any white population.

The authors would have us recognise that pulmonary tuberculosis is an infectious disease, differing from other infectious diseases and concealing its real nature only by the fact that its incubation period is often reckoned in years. Those concerned with the care of the tuberculous should study these papers carefully; it is much to be hoped that similar studies may be pursued in this country by those to whom the opportunity is available.

CATGUT AND TETANUS

SEVERAL cases have recently been reported in this country of tetanus following surgical operation in which catgut has been used as a ligature material, and the question has arisen whether the catgut may not have been the source of infection. The Therapeutic Substances Regulations of 1931 placed the commercial production of sterilised gut under expert control by the Ministry of Health, and since then the risk of non-sterile catgut reaching the hands of surgeons is lessened, if it has not been actually eliminated. An American investigation [1] has suggested that catgut, prepared by commercial firms in several countries of the world, is still often non-sterile. It seems fairly clear, however, that such British material as was used in this investigation dates from the period before the application of Government control. But this control only applies to catgut as it is offered for sale and not to gut prepared in hospitals or by surgeons for use in institutions or private work. From the discussion (see p. 366) last week at the Royal Society of Medicine it is evident that grave risk is being run from the use of catgut prepared under inadequate control. The dry unsterilised gut, used as raw material by some of the smaller hospitals which prepare their own ligatures, teems with micro-organisms—anaerobes and aerobes with their spores—to deal with which demands efficient processes of sterilisation, scientific rather than traditional. As W. Bulloch showed in 1929 it is possible under ideal conditions of manufacture, with the use of heat and certain chemical substances, to prepare catgut which satisfies routine bacteriological investigation. Whether such material will still be proved sterile after it has been subjected to digestion in the tissues remains to be seen; but the clinical experience of hundreds of surgeons, in thousands of cases where standard commercial catgut has been used, suggests that the risk is extremely small. What has been done so successfully in some hospitals should be feasible in others, and the time has come when the sterility of every brand of catgut used by surgeons should be controlled by standardised investigation. It is urgently necessary that some cheap and efficient method of sterilisation should be placed in the hands of the smaller hospitals and private surgeons who sterilise their own catgut, which, if rigidly followed, would remove a risk which, if numerically small, is yet a very terrible one. Where catgut is employed, as it generally is, because it is absorbed by the tissues, obviously the interior of the catgut must be as sterile as the exterior; and digestion methods in the bacteriological laboratory afford the only means of checking this. When delayed absorption is the aim the surgeon should satisfy himself that the 20, 40, and 60-day catgut is really absorbed within a few days of the time specified on the containers.

[1] Clock, R. O.; Surg., Gyn., and Obst., 1934, lix., 899.

A REMEDY FOR VAGINAL INFECTIONS

DEVEGAN is the manufacturers' name for a combination of 4-oxy-3-acetyl-amino-phenyl-arsinic acid with boric acid in a carbohydrate vehicle. The arsenical constituent is, therefore, identical with the arsenical derivatives, Stovarsol, Spirocid, and Orarsan, which are widely used in the oral therapy of syphilis. The compound is made in the form of tablets for insertion into the vagina and for some time has been available to the medical profession in this country. The advantages claimed by German writers are that it causes vaginal discharges—particularly those associated with the flagellate protozoön *Trichomonas vaginalis*—to diminish in satisfactory and often remarkable fashion; and that much inconvenience and expense are saved to patients owing to the ease with which self-treatment can be carried out. The unpleasant and sometimes harmful practice of regular vaginal douching can thus be dispensed with.

It is inevitable that a new preparation which is relatively inexpensive and easy of application and produces a fair proportion of excellent results should be employed somewhat indiscriminately when its advantages are first appreciated. Accordingly, it is useful to have Hauptstein's [1] review of results in 185 cases of vaginal discharge treated with devegan at the gynæcological clinic of the University of Freiburg (Brei gau) during 1933–34. By far the best results, he says, were obtained in those whom it was possible to treat as in-patients; among out-patients the results were less encouraging, while the effects of self-treatment at home were regarded as quite unsatisfactory—a result attributed to lack of coöperation. As many as 48 per cent. of this last group failed to remain under observation and it was decided not to proceed with the investigation in this series. Among in-patients, the procedure adopted varied according to the severity of the infection and the amount of discharge. All self-douching was prohibited. Where conspicuous inflammatory changes of the vagina wall were noted the earlier insertions of devegan were preceded by vaginal douche of silver nitrate 3–5 per cent. or 1 per cent. corrosive sublimate, or both, and this was continued until the local condition showed improvement. One to four tablets of devegan were inserted high in the vaginal fornices, at first twice daily (if this was considered necessary), and then at lengthening intervals until finally the treatment was given just after the menstrual periods only. In more than two-thirds of the cases the desired result was produced within two weeks to two months. Some patients complained of the thick unpleasant discharge of unaltered masses of devegan, but this difficulty was overcome by the insertion of vaginal plugs of cotton-

[1] Hauptstein, P.: Med. Welt., Dec. 21st, 1935, p. 1845.

wool, which the patients themselves could remove after 24–36 hours. The criteria of success were the absence of recurrence of discharge long after discontinuance of the treatment, the absence of the trichomonas flagellate on microscopic examination of the vaginal secretion after menstruation, and the presence of normal vaginal flora including the lactic acid bacillus. Impressions of the treatment were definitely favourable, both in trichomonas infections and those which were believed to be non-specific. Complete disappearance of discharge or substantial improvement occurred in all but a small proportion of cases (about 8 per cent. of the trichomonas infections and about 4 per cent. of the non-specific). Hauptstein regards the results as definitely superior to those obtained with the various antiseptic douches formerly in vogue, and he puts down relapses and partial failures to irregular attendances or indiscretions on the part of the patients, though the possibility of residual infection in urethra, rectum, or uterus, causing reinfection, is mentioned. A small number of patients showed toxic symptoms which were believed to be the result of the treatment: in 1 case there was nausea, in 9 there was local discomfort or pain of an itching and burning type, and in 1 there was œdema of the labia.

In this survey no mention is made of gonococcal infections, and it should be emphasised that there is as yet no evidence that devegan is effective in eradicating the gonococcus from its usual haunts. The practice of applying this treatment before full investigation to exclude gonococcal infection has been carried out must be condemned unreservedly, since it is likely to make the subsequent isolation of the causative organism difficult or impossible. Moreover, it should be noted that the method of self-treatment is usually unsatisfactory, even where the coöperation of the patient is assured, because of the mechanical difficulty of placing the tablets high in the vaginal fornices. Dr. Collis,[2] who reports from Birmingham that all but 7 of 47 patients were clear of trichomonas infection after three months—and 5 of the 7 had an associated gonorrhœa—points out that "all the patients were treated at the clinic as it was found that the tablets were more effectively inserted by an experienced person."

ANÆSTHETICS IN THORACIC SURGERY

NOT many years ago lobectomy was a rare operation only to be witnessed at special chest hospitals. It is now a commonplace in these institutions and is likely before long to be included in the routine list of operations performed at large general hospitals. In an address to the section of anæsthetics of the Royal Society of Medicine on Feb. 7th Dr. I. W. Magill commented on the diversity of methods of securing anæsthesia for this operation. His own preference appears to be for cyclopropane, although this is admittedly contra-indicated when diathermy is used, and for spinal analgesia, the advantage of which according to Dr. Magill is becoming more and more obvious in thoracic surgery. The fear that respiratory paralysis may supervene when spinal anæsthesia is administered to patients with already limited respiratory capacity is apparently not confirmed by clinical experience. No doubt, said Dr. Magill, the explanation lies in the fact that the motor roots are so much less affected by the injection than the sensory that good analgesia is obtainable without corresponding depression of respiratory movement. This explanation was accepted by Dr. Langton Hewer, who in the course of the discussion voiced his general preference for nitrous oxide and oxygen which does not, he claimed, imply cyanosis. He recommends in severe chest operations the early insertion of a rectal tube through which glucose should be given towards the close of the operation. Dr. Magill disapproves of premedication by any drugs with prolonged action. He employs some of the barbiturates, which are quickly metabolised, and believes that one will still be discovered better than any yet available. In many of the thoracic operations it is necessary to employ suction of the bronchi in association with intubation, and it is often a great advantage to block off other portions of the lung. He showed an ingenious apparatus which he has devised and uses for this purpose. Mr. J. E. H. Roberts thought that diathermy was almost essential in lobectomy and precluded the use of any inflammable anæsthetic. He did not like nasal intubation, and he drew attention to the very small amount of lung with which respiration could be effectively performed. Mr. H. P. Nelson likes cyclopropane for the quiet respiration it secures in the patient, but a disadvantage is that it increases the bleeding. In his view cyclopropane seems to lead the field for mediastinal dissections.

FOR THOSE ABOUT TO MARRY

THE scheme for voluntary prenuptial health examinations issued by the Eugenics Society this week[1] is constructed on such a broad foundation that it may well develop into a service of national importance. The scheme differs from those established in certain European countries in many respects, of which the most important is that it is designed only for those who themselves seek information and advice before contemplating marriage and indeed could not be worked on a compulsory basis. Moreover, the examination is not intended solely to serve the purpose of preventing dysgenic marriages or of checking the fertility of undesirable stocks—it has the further aim of improving the prospects of a successful and happy marriage. The distinguishing features of the scheme are that the applicant deals only with a doctor of his choice, through whom alone he can receive the schedules to be filled up. If the doctor is in doubt about the significance to be attached to the answers to the questions, or to his own findings on physical examination, he can seek the opinion of a consultant; or if it is a problem of heredity that puzzles him the Eugenics Society will be prepared to help in its solution through the good offices of a board of specialists. It is recognised that some doctors who are especially interested in the subject will have formulated their own questions and methods of physical examination. But in view of the infrequency of the demand hitherto it is likely that others may have little experience of such examinations and may be glad to use the pattern of premarital health schedule here provided.

It consists of three parts of which the first relates to the applicant's family history—notably consanguinity of proposed partners, the ages and causes of death of near relatives, and, more important, the incidence in near and distant relatives of diseases and defects (specified) which are thought to be hereditary. The second part of the schedule is divided into three sections, A, B, and C, in which questions are asked about (A) physical diseases, (B) psychological abnormalities, and (C) sexual

[2] Collis, J. L.: Jour. Obst. and Gyn. Brit. Emp., February, 1936, p. 87.

[1] Obtainable from the general secretary of the society at 69, Eccleston-square, London, S.W.1.

problems. The questions on physical diseases have been framed in accordance with the experience of insurance companies; those on possible nervous troubles bear the stamp of wise psychological advice; while the third section is skilfully planned to enable the applicant to indicate the sexual problems preoccupying him by the simple deletion of the words yes or no in answer to non-committal questions. These questions should cause little or no embarrassment to those who, having become engaged, develop anxiety about their future sex life which makes them highly sensitive to any direct attempt to probe their difficulties. A quiet chat some time after they have said "yes" to any such general question as whether the subject of sex is at all repugnant or whether there are any worries about past or future sex life that they would like to discuss, is likely to do much to reassure them. The third part of the schedule—giving space for results of physical examination—is in the form of leaves that can be used separately and should be retained by the doctor, with some confidential notes for his guidance. He is reminded that among the reasons for which a health examination may be sought before marriage are: the anxiety of parents; misgivings about hereditary diseases or defects; present abnormalities such as heart disease, glycosuria, and so forth; past diseases, often venereal; desire for specific reassurance of a general nature; and desire to break an engagement. Most doctors have had experience of the neurotic who develops ailments which serve the purpose of postponing a marriage which is not really desired. A man has even been known to ask to be examined and to draw attention to some real or imaginary disability in order to get out of an action for breach of promise.

It is clear that the Eugenics Society in issuing these schedules is in no way trying to override the functions of the practitioner, who is in fact made the central agency through whom they will be distributed. The society will not communicate with individual applicants and indeed will come into the picture only when its help is needed on a genetic problem. We believe that family doctors who have not hitherto given much attention to these problems will welcome assistance in dealing with them.

THE ACTION OF POSTERIOR PITUITARY ON THE COLON

IN 1909 the late Prof. Blair-Bell observed violent peristalsis and expulsion of fæces in rabbits after pituitary extract had been injected intravenously, and recommended its use in man in conditions of intestinal stasis. It has since been widely employed in clinical practice. Further observations on animals, however, threw doubt on its power of increasing intestinal movements, and in the intact unanæsthetised dog it seems clear that movements are inhibited.[1] Since the separation of pituitary extract into "pitressin" and "pitocin" it has been suggested that many of these discordant results may be due to a difference in the actions of the two principles on different animals. In this connexion observations on the action of pitressin and pitocin on the human colon are of especial interest. Macdonald and Settle[2] have recently studied the action of the separated principles by inserting a balloon into the proximal colon of patients with colostomies. Intravenous injection of 1–2 units of pitressin were found to produce peristalsis in 2–3 minutes, usually accompanied by loss of fæces or flatus. Pitocin was usually ineffective, but it did not inhibit the action of pitressin as it does in dogs.[3] Similar results were obtained when the drugs were given while X ray examinations were being made. It is noteworthy that subcutaneous or intramuscular administration of pitressin gave a response which was always delayed, and often feeble in intensity, and this raises a point of practical importance. Pitressin has been shown to cause constriction of the coronary vessels,[4] and if administered indiscriminately might well give rise to dangerous reactions. On the other hand experience seems to show that pituitary extract given intramuscularly is usually clinically satisfactory in the treatment of post-operative intestinal distension, or where it is desired to remove gas from the colon preparatory to X ray examination of the renal tract. It would nevertheless be of interest if alternative drugs for this pupose, such as eserine,[5] Prostigmin,[6] prostigmin plus pituitrin,[6] or acetylcholine[7] were more widely used and reported upon, so that their relative merits could be more fully assessed.

[1] Gruber, C. M., and Robinson, P. I.: Jour. Pharmacol., 1929, xxxvi., 203.
[2] Macdonald, A. D., and Settle, H. L.: Jour. of Physiol., 1936, lxxxvi., 8 P.
[3] Elmer, A. W., and Ptaszek, L.: Compt. rend. Soc. de biol., 1930, civ., 540.
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Sir Thomas Barlow has been elected a member of the French Academy of Medicine.

THERE is universal sympathy with Sir Humphry and Lady Rolleston in the tragic death of their only remaining son during an *émeute* in Zanzibar. The feeling will be specially present in the medical profession, where Sir Humphry Rolleston, in private as well as in many important public positions, is regarded with such real respect and affection.

ON Feb. 17th and 26th and March 2nd the Lettsomian lectures of the Medical Society of London will be delivered by Dr. Philip Manson-Bahr in the Society's house in Chandos-street at 9 P.M. He will speak on the differential diagnosis of diseases of the colon (dysentery and colitis) and their complications.

Sir Herbert Cooke, whose death occurred on Feb. 6th in St. George's Hospital as the result of an accident, was a distinguished soldier with a great Indian record behind him. Also he was a practical philanthropist and a worker in an important medical cause. Retired as a lieutenant-general while still comparatively young and full of energy, he adopted as a hobby the London Children's Gardens Fund and during his connexion with the movement secured a greatly increased support for the valuable project of securing for London's poorest slum children the joy of possessing a garden, and in this work he found the health of the children an efficient argument for soliciting support. Recently he had taken charge of the activities for securing the money for the rebuilding of St. George's Hospital, and his work had already borne fruit, the results of his capacity and ingenuity in planning becoming evident. He regarded that work as only initial to larger developments, and his sudden death is a great loss to a charitable cause into which he had thrown himself with enthusiasm.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXVIII.—PROGNOSIS OF FRACTURES OF THE UPPER END OF THE FEMUR

FRACTURE of the upper end of the femur is frequently followed, within a few weeks or months, by the death of the patient. Of 615 patients who were admitted during twenty years to Lambeth Hospital 166 died without leaving the hospital, and of the remainder a large number were left with a disability that materially reduced their enjoyment of life. This high mortality and grave disability is, however, not so much due to the injury itself as to the fact that it is an injury that occurs much more frequently among the old than the young, among the feeble than the strong. The average age of the patients mentioned above was 69 years, and in many cases the fracture was an incident in their final illness, hastening the end little, if at all.

Factors to be Considered

In giving a prognosis in any particular case several factors must be considered.

AGE OF THE PATIENT

The older the patient the more chance there is of death occurring directly as a result of the injury. Old people are much less able to put up with the discomforts attendant upon the treatment of even minor injuries than are the young, and any attempt to submit them to an unpleasant régime may bring about fatal complications.

CARDIOVASCULAR DISEASE

A large number of patients who sustain this injury are suffering from cardiovascular disease, and many of them have had a cerebral thrombosis or other disabling complication. Indeed the reason why this fracture mainly occurs late in life is because it can only happen when bones have been rendered brittle and muscles have lost their tone. It is for this reason that the mortality of the injury is so high. In this connexion it is interesting to note that there are two different periods after the fracture at which death tends to occur in feeble patients: (1) those who die within about fourteen days, being unable to adapt themselves to the altered circumstances which the injury produces; and (2) those who live for eight or ten weeks and make an apparent recovery only to die when the first attempt is made to get them out of bed. In the latter group are patients whose hearts are only strong enough to keep them alive when at rest and are unable to stand the strain of movement. A large proportion of patients who die after this injury fall into this second class.

SITUATION OF THE FRACTURE

For the purposes of prognosis only three situations need be considered: (*a*) fracture through the neck; (*b*) fracture through the great trochanter; (*c*) fracture immediately below both trochanters. As regards mortality there is little difference between these three situations. Among the above-mentioned 615 patients, 24·5 per cent. of the fractures of the neck, 29·3 per cent. of the fractures through the great trochanter, and 25 per cent. of the sub-trochanteric fractures died without leaving hospital, but there is a great difference between the prognosis of the three types in regard to functional results.

Fractures through the neck, when they occur in young people or in people who are healthy enough to undergo severe operations or prolonged and trying treatment, have a very good chance of getting bony union in moderately satisfactory positions and of being restored to almost full functional use of the limb. Treatment by a Whitman's plaster without open operation but with manipulation under an anæsthetic, or by the insertion of a Smith-Petersen's pin, the position of the fragments being determined by open operation, both give good results in the hands of experienced workers. It is probable that Whitman's method is applicable to a larger number of patients but Smith-Petersen's pin shortens somewhat the time during which treatment is necessary. For those who are unable to stand either of these methods of treatment a strong fibrous union can generally be secured by fixing the patient on an extension frame with both lower limbs suspended and widely abducted. If this position be retained, without interruption, for ten weeks a firm fibrous union will form and the patient can then walk about with the help of a calliper splint, which should be worn for a period of one or two years. Movements of the hip in these patients with fibrous union are generally painless over a very small range of movement, but cause pain when the patient is fatigued or when any extended range of movement is attempted.

Fractures through the great trochanter, while having the same mortality as fractures of the neck for reasons given above, should cause very much less disability if they are properly treated. They practically never fail to join firmly by bony union, and if properly disimpacted and placed in good position in an extension frame with both legs abducted the union will generally be firm in eight weeks, and the patient afterwards will walk with but little disability. If the fracture is firmly impacted and the patient is very feeble it is sometimes tempting to allow the impaction to remain, with the bones in bad position, and to let the patient walk about as best he can within two or three weeks of the fracture. Such a method is sometimes, though rarely, successful; more often the patient's disability is so great that his feebleness is increased by the added effort of moving with a deformed limb. It is probably always better to disimpact if it is at all possible to give the patient an anæsthetic. The operation should never be done without an anæsthetic.

Sub-trochanteric fractures occur in patients whose bones are unusually brittle, and frequently in those bones which are the seat of neoplasm. The prognosis in this case is that of the disease and not of the fracture.

THE TIME WHEN TREATMENT IS FIRST APPLIED

To get the best results in fractures of the femur the patient must be cared for by skilled nurses with experience in this class of injury. Unless steps are taken to reduce deformity, and to secure such apposition of the fragments as is possible, within about forty-eight hours of the fracture, there is little likelihood of a good result being obtained. During the first two or three days after the fracture there is a great danger that the feeble patient may be worn out by pain and acquire bedsores, thus preventing subsequent effective treatment. It is surprising with what rapidity bedsores may form during the

first few hours in these cases, and the best way to prevent them is to apply, as a first aid, a simple axial extension by means of a Buck's stirrup to both legs and to place them on a frame by a counterpoise, thus lifting part of the weight of the helpless limbs off the bed. The practice of placing the damaged limb between sandbags as a first-aid measure cannot be too strongly condemned; the only effect of such sandbags is to make sure that any movement of the patient's body, occurring while the leg is held still, will take place at the site of the fracture, causing pain to the patient and further laceration of the damaged tissues, and materially lessening the prospect of a satisfactory recovery.

GEORGE F. STEBBING, M.B. Lond., F.R.C.S. Eng.
Surgeon Specialist, Lambeth Hospital.

SPECIAL ARTICLES

TEA AND COFFEE

A PHARMACOLOGICAL DISCUSSION

AT a combined meeting of the Society of Public Analysts and other Analytical Chemists with the Society of Chemical Industry (Food Group), held at the Chemical Societies Rooms, Burlington House, Piccadilly, on Feb. 5th, the chair being occupied by Mr. JOHN EVANS, M.Sc., F.I.C., president of the first-named society, a discussion on tea and coffee, with special reference to their tannins and alkaloid, was opened by Dr. G. ROCHE LYNCH, analyst to the Home Office. It was, he said, generally assumed that the pharmacology of tea and coffee could be stated in terms of caffeine—which he very much doubted. He understood it to be agreed that tea contained, on the average, 2½–4½ per cent. of caffeine, and coffee 0·5–1·5 per cent. of caffeine. The action of caffeine on the body could be divided into three groups: its effect on the central nervous system, its action on muscular tissue (including heart muscle and that controlling the intestines), and its diuretic action or promotion of the flow of urine.

THREEFOLD ACTION OF CAFFEINE

The action of caffeine on the *central nervous system* was almost entirely in the form of a psychical function, i.e., on the higher centres of the brain. If it were taken in toxic doses, it might exert an effect on the spinal cord similar to that of strychnine, namely, in producing convulsions. In the course of its action on the central nervous system caffeine facilitated the perception of sensory stimuli and the association of ideas, so that consciousness became, under its influence, more acute. One of the results of that was a condition of wakefulness or increased alertness, and so any tendency to drowsiness or fatigue was made to disappear or was much less pronounced. A corollary to this was that interpretations of sensory stimuli received by the brain from various external sources became more perfect and accurate. Even more important was the fact that these stimuli were correctly placed in relation to each other. In this latter respect there was a profound difference between the effect of caffeine and that of cocaine, for in the case of the latter, in addition to the increased perception of the higher centres, enhanced impressions from the lower centres were also received, and the impressions were not so perfect as in the case of caffeine. Thus with cocaine the tendency was for the judgment to be impaired; with caffeine the accuracy of the judgment was enhanced. Caffeine also caused a constriction of the musculature of the blood-vessels, leading to a rise in blood pressure, and respiration was stimulated. The centres controlling these functions were situated in the lower part of the brain, and that was an additional fact in the pharmacology of caffeine. If a person took a very large dose of caffeine, the process just described was intensified, and the result was a confusion of thought, and disorders of sensation, which were associated with flashes of light in the eyes and noises in the ears, so-called tinnitus. If extreme doses were given, this excitation proceeded to restlessness and the receiver became tremulous, and might develop convulsions, as followed strychnine poisoning.

With regard to the action on *muscle tissue*, he reminded his hearers that from the medical point of view muscle was divided into three kinds: voluntary muscle, the working of which was controlled by the will; cardiac muscle, a specialised form; and the involuntary muscle, such as that in the intestines and the blood-vessels, not under the immediate control of the will. Although not definitely known, it was believed that caffeine acted directly on the muscle-cells, not on the nerve-cells; and the muscular work performed by the person taking caffeine could be increased without that person feeling fatigued in corresponding degree. Here arose a difficulty, as it was impossible to say whether or not the abolition of the feeling of fatigue was due to an effect of the drug on the muscles or on the central nervous system. As would be expected from what he had said, caffeine was a factor in producing contraction of blood-vessels and intestines, and their more vigorous action. There occurred also in those who had taken caffeine a general acceleration of the heart beat, with a diminution of the diastolic period; hence if the dose were large over a period of time the effect on the heart might be definitely unfavourable. In ordinary medicinal doses, however, the taking of caffeine seemed to have no deleterious effect. The cardiac state after taking large doses of the drug may take the form of auricular fibrillation. Conceivably this might lead to death, though actually death from caffeine is very rare.

With regard to the *diuretic action* of caffeine, the increased flow of urine promoted by it was due to a greater output of water, so that the urine itself became more dilute than normal; but tested over an appreciable period, there was found to be, not only an increase in the total urinary output, but also in the total solids passed. This elimination of water was among the valuable results of the medicinal use of caffeine, as seen in patients who were suffering from dropsy, hence the special value of the drug in heart failure or of kidney disease. This increased elimination of water was found to be partly due to the raised blood pressure, and partly to the specific action of the caffeine on the cells of the kidney, enabling them to excrete water and, to some extent, solids too, in greater amount. Some of the caffeine is decomposed in the body, some excreted in the urine in an unchanged condition, and some in a partly de-methylated form, i.e., mono- or di-methyl xanthine (caffeine is trimethyl xanthine).

OVERDOSE. ADDICTION. SLEEPLESSNESS

Dr. Roche Lynch said he had not yet encountered a case in which death was definitely caused by an overdose of caffeine. As much as grs. 60 of the drug had been taken at a time, but the serious illness which immediately resulted was recovered from. After taking very large doses of caffeine the person manifested the form of excitation which may be seen in people drunk from alcohol; dizziness, a ringing and buzzing in the ears, trembling, sleeplessness, confusion of ideas, delirium, palpitation of the heart, and even strychnine-like convulsions.

He did not consider that caffeine could be included in the drugs which came under the heading of addiction. People who took it in the form of coffee and tea became accustomed to it, and as they looked forward to it and liked it they found it difficult to do without it. Still, as opposed to the case of cocaine and morphine, it could be given up without much mental effort or feeling of loss, and its indulgence did not cause the serious train of symptoms which followed the habitual taking of cocaine and morphine. In post-mortem examinations he did not believe that any changes in the stomach and intestines occurred in those who had drunk largely of the beverages tea and coffee that could be associated with such drinking. He knew of no cases warranting the suggestion that either caffeine or the tannin could produce such an effect.

With regard to sleeplessness, he felt himself to be in somewhat of a difficulty, and he invited suggestions. All must know people who said they dare not take coffee after dinner, as it would keep them awake half the night; some said they always took a cup of tea instead, while others said that if they wished to do writing late at night this was made easier by taking a cup of tea. On the other hand, when people had narcotic poisoning, coffee administered per rectum was a common remedy employed. That the association of these beverages and sleeplessness may be largely psychical was suggested by the fact that in many cases if one gave caffeine citrate in a medicine unknown to the patient, there was often no interference with his sleep. Though he had pointed out various attributes of caffeine, such as increased stimulation, he felt there must be some further factor in the beverages under discussion which had definite effects in regard to sleep, but which at present could only be conjectured.

TANNIN IN TEA

In a paper on the tannin-content of tea, by Mr. P. J. NORMAN, F.I.C., and Mr. E. B. HUGHES, D,Sc., F.I.C., the authors referred to the lack of knowledge of the exact nature of tea-tannin, and for this reason they had made comparative extractions of tea-tannin by the more important of the methods employed. They pointed out that tannin is present in all tea, that it is an important constituent in that it contributes largely to those properties which characterise the quality of tea, and that there is more tannin in good leaf than in poor leaf and less in stalk than in leaf. The methods used for the comparative analyses were:—

1. Cinchonine precipitation of the tannin;
2. The Löwenthal method of oxidation of the tannin by potassium permanganate; and
3. The hide-powder method.

Results obtained showed that teas of the same class could be compared, as regards tannin-content, by any one of these methods, but that there was some difference in results by the three methods for any one tea, this depending on whether the tea was a black (fully fermented) tea such as Indian, Ceylon, China, &c., or a green (unfermented) tea (little drunk in this country), or Oolong (lightly fermented) tea. There was also some difference among black (Indian and Ceylon) teas which the authors considered to be due to the grading (by fineness) of the tea. Results were given for a large number of unblended teas of known origin, varying from 10 to 17 per cent. of the dry tea for black teas, and 9 to 15 per cent. for green and Oolong teas. The authors had also determined the tannin-content of a number of teas sold to the public as "digestive," "invalid," &c., teas; these were found to have the same tannin-content as the ordinary commercial teas of the same class (black teas of Indian, Ceylon, China, &c.). It was pointed out that infusions of tea, as ordinarily prepared for drinking, contain about two-thirds of the tannin from Indian or Ceylon tea and about one-half of the tannin from China tea.

COFFEE EXTRACT

Mr. EDWARD HINKS, B.Sc., F.I.C., read a paper on coffee extracts. A considerable proportion of the fluid consumed in this country as coffee must, he said, be reconstituted from coffee extract. The proper criterion of the value of an extract was, he thought, that its composition when reformed or reconstituted should be as close as possible to that obtained from the native article, a parallel case being condensed or dried milk in comparison with liquid cow's milk; the loss should be only that inseparable from the processes of drying or condensing. His experience was that extracts purporting to be pure coffee were comparatively rare, coffee and chicory extracts being the commoner. But judging from the samples he had received the caffeine in the two classes did not differ much, the coffee extracts (12 in number) containing from 0·1 to 0·33 per cent. of caffeine (average 0·21), and the 45 coffee and chicory extracts containing from 0·05 to 0·38 per cent. (average 0·19), though there might be some doubt about the designation of some of the coffee extracts. A dry extract he had examined contained 6·8 per cent. of caffeine. Taking the caffeine as a basis of evaluation, the poorest extracts gave a "coffee" only of from one-tenth to one-fifth the strength of ordinary breakfast coffee made from the berry and even at the best they were but a poor approach to the real article. Why then did these beverages look so much like coffee? It appeared to be due to the use of caramel. A comparison of the costs, again on the basis of caffeine, gave some humorous results. In pure coffee at 2*s.* 6*d.* per lb. a "unit" of caffeine cost 7*d.*; in the dry extract it was 6·2*d.*; in a "0·22 per cent." coffee extract it was 28*d.*, and in a "0·1 per cent." coffee and chicory extract it was found to be 41*d.*

UNSUPPORTED CLAIMS

Mr. AINSWORTH MITCHELL, D.Sc., F.I.C., read a communication from Mr. H. H. BAGNALL, B.Sc., F.I.C., city analyst of Birmingham, in which he spoke of the results of his analyses of a number of packet teas whose wrappers bore various claims, mainly in the direction of preventing or curing digestive disorders because of the absence from the teas of tannin. In every case those claims were unsupported by scientific fact. In the alleged tannin-free teas he found from 9·9 to 16·4 per cent. of tannin, the average of a series being 12·5 per cent. Two China teas contained 8·6 per cent. of tannin. One brand of tea was stated to contain only the tips of leaves and therefore to be tanninless; it had the average quantity of tannin and was ground fine to give the

idea of tips. One brand was stated to be curative because of the large vitamin content, but it had only a trace of one vitamin—namely, E. In many cases a representation to the firms of the error in the claims made resulted in modification of the wording on the packets.

Mr. A. L. BACHARACH, M.A., F.I.C., asked whether caffeine could be regarded as a cumulative poison, and if so, was it cumulative because it was stored and then gradually used by the body, or because its adverse effect on certain organs continued for a considerable time?

Mr. H. H. MANN, D.Sc., F.I.C., assistant director of the Woburn Experimental Station, remarking that he had been connected with the tea industry for 36 years, said there was no relationship between the price paid for tea and its caffeine content. Other things being equal, teas of high tannin-content were generally superior. Taste was an important factor in the choice of teas, and he thought an investigation should be made into the different forms of tannin which tea contained before dogmatic statements could be made about its effect on quality.

Mr. L. H. LAMPITT, D.Sc., F.I.C., agreed with Dr. Mann about the importance of taste. In making claims that their teas were tannin-free the proprietors of some packet teas were no doubt playing up to the public imagination of tanning the stomach. Dr. Roche Lynch, he recalled, could find no post-mortem evidence of stomach tanning.

Dr. ROCHE LYNCH, in a brief reply, said that any cumulative effect of caffeine might have was not from storage, as it was quickly broken down in the body.

VIENNA

(FROM OUR OWN CORRESPONDENT)

DEATHS IN THE PROFESSION

THE University of Vienna has had a serious loss in the deaths of Prof. Maresch and Prof. Bruno Busson. The former, who died of bronchial cancer at the age of 68, first worked at the institutes of anatomy and pathology in Prague. When he came to Vienna he began to study surgery and gynæcology but he soon forsook them for morbid anatomy. He was chief pathologist at the Rudolfs-spital and also in the Municipal Hospital. He was appointed a lecturer by the university in 1910 and in 1923 succeeded Paltauf in the chair of morbid anatomy, which he held till his death. His early work was on the epithelial bodies and the histology of the kidney, and his staining methods were unique; he devoted his later researches to the problems of the internal secretions. His institute contains a splendid museum which is chiefly the result of his own work. He was an excellent teacher, and as an authority on morbid anatomy his reputation was international. Busson was director of the federal Serotherapeutic Institute, which controls all the vaccines and sera used in Austria. He graduated here and studied hygiene and bacteriology in Graz and Paris. During the late war he was in charge of the Health Commission and was responsible for the comparative freedom from war epidemics at the front and in the hinterland. His work was mainly concerned with immunity and experimental medicine especially with tetanus and diphtheria.

THE FIRST AID SOCIETY IN 1935

The ambulance corps here, which served as a model for the others in Europe, has dealt in the past year with 26,134 emergencies, an average of 72 daily. The proportion of injuries to sudden illness, three to two, has remained constant for about eight years. There were 3112 traffic accidents; 1775 of these were due to motor-cars, 757 to pedal cycles, 419 to tramcars, 111 to horse-driven vehicles, and 50 to railway accidents. Sport and athletics were responsible for 725 casualties, 414 persons were bitten by animals, and 1685 were injured in factories. Members of the society also attended 391 women in precipitate labour, 2000 cases of suicide and attempted suicide, 230 of insanity, and 180 of alcoholic excess. The close coöperation of police and hospital staffs with the society ensures an immediate response to emergency; 15 lives, for example, were saved by this efficiency after injuries to the heart by stabbing or shooting; while the patient is being hurried to hospital in an ambulance the surgical staff have already been warned and are prepared to operate at once.

CORONARY OCCLUSION

Dr. N. Landau has recently been speaking on the pathology and treatment of cardiac infarct. In the Vienna Heart Hospital there have been in the last three years 150 cases of sudden coronary occlusion; 80 per cent. of the patients were men, 45 per cent. were aged 55–65, and 30 per cent. aged 45–55; but 8 per cent. were not yet 45 and 2·5 per cent. were under 40. The majority (78 per cent.) had some previous symptoms such as dyspnœa, vertigo, intermittent claudication, or those of hypertension. In 21 per cent. the precise time of onset could not be determined, and neither exercise nor the time of the day seemed to have any influence. The majority had had angina pectoris for about five years but in 4 per cent. it was entirely absent; other symptoms were cold sweats (25 per cent.), dyspnœa (25 per cent.), angor animi (18 per cent.), nausea and vomiting (15 per. cent.), and unconsciousness (10 per cent.). In 91 patients brought in with a recent infarct the clinical findings were few; 60 per cent. had weak murmurs, while of the 23 that had a gallop rhythm only 7 survived. An important sign almost constant enough to be considered pathognomonic was a rise of 1–3° C. in the rectal temperature, present in 75 per cent. and remaining for about a month in 30 per cent. Blood pressure was low in 60 per cent. and remained so for several weeks. A tachycardia not affected by digitalis was a bad sign. The electrocardiogram was always abnormal; in 83 per cent. it was characteristic of occlusion of a coronary branch and in 17 per cent. of myocarditis. The mortality was 30 per cent., of whom a third died suddenly, some even in convalescence; the rest died after getting progressively weaker in spite of all treatment.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

TREATMENT OF LUPUS VULGARIS

Dr. Robert Aitken, at last week's meeting of the Edinburgh Medico-Chirurgical Society, reported strikingly good results in the treatment of lupus vulgaris by the use of the Finsen-Lomholt lamp. In the past five years, he said, 0·6 to 1 per cent. of the new cases seen in the skin department of the Royal Infirmary of Edinburgh were cases of lupus vulgaris; fifteen years ago the incidence of this disease was three times as great. He has investigated 310 patients and the face was affected in 77 per cent. of them.

In more than half, the disease began during school life, and it is uncommon for it to commence after middle age. He stressed the frequency with which this condition is associated with tuberculous glands, and said that during the past seven years 116 cases of lupus with tuberculous adenitis were treated at his department. Until recently lupus has been a very intractable disease, and the results of the old forms of treatment were often unsightly. Dr. Aitken condemned, in particular, the end-results of X ray treatment, for the scar of the burn is disfiguring and it often stimulates the development of carcinoma. In his opinion the diminishing incidence of lupus is due to the successful treatment of tuberculous glands with general light baths, without which many would have developed lupus at a later age. The general treatment of lupus necessitates the use of the hygienic and dietetic measures that apply to the treatment of all forms of tuberculosis. Tuberculin is the remedy of choice in the absence of facilities for light treatment. Excision, scraping, and cauterising are all unsatisfactory, and they fail to remove the disease from the deep skin glands; X ray treatment should also be given up. The original Finsen light treatment was satisfactory up to a point, but whereas only 15 per cent. of the radiation energy of this lamp could be applied to the diseased surface the corresponding figures for the new Finsen-Lomholt lamp is 70 per cent. This increase in power has enabled the time required for each treatment to be reduced to no more than one hour, and its convenient construction makes the application much less tiring for the nurse in charge.

Dr. Aitken showed a number of beautiful coloured slides showing that even in an advanced state the disease could usually be cured in about six months. Reports of a large series treated in Vienna from 1914 to 1923 show that the striking results are usually permanent.

GLASGOW ROYAL INFIRMARY

In the 141st annual report of the managers of Glasgow Royal Infirmary it is stated that there were over 18,000 in-patients and 120,000 out-patients during the past year. There has been a deficit on the ordinary account of over £26,000; the extraordinary receipts totalled £62,000, and it was possible to carry £28,000 of this to the capital account. The managers hope that the Canniesburn auxiliary scheme, the foundation-stone of which was laid by the Duke of Kent in May of last year, will be completed by the end of 1936. These buildings will provide 80 beds for patients in early stages of convalescence, together with 40 beds for paying patients of limited means. It is hoped that the provision of these additional buildings will reduce the number of patients awaiting admission to the infirmary.

THE LATE PROF. ASHWORTH

Edinburgh graduates who have enjoyed his teaching will feel that the university has lost one of its outstanding figures by the sudden death of Prof. James Hartley Ashworth, F.R.S., of the chair of natural history. It was because of his important work in invertebrate zoology that large contributions were made to the university for building the new zoological laboratories. He was particularly interested in entomology and protozoology and had conducted a class in this subject in the university since 1905. His life and energies were devoted to his science and to the university, in which he taught for nearly thirty-six years. He was everywhere popular and was always anxious to help his colleagues and his students.

IRELAND

(FROM OUR OWN CORRESPONDENTS)

THE NATIONAL MATERNITY HOSPITAL

THE governors of the National Maternity Hospital, Dublin, are engaged in promoting a private Bill with the object of amending their charter, altering the name of their corporation, and effecting other changes in their powers and constitution. The preamble of the Bill has been declared proved and the Bill now lies on the table of the Dáil. The National Maternity Hospital, which is familiarly known as Holles-street Hospital, was founded in 1894 for the relief of poor lying-in women and for the treatment of diseases peculiar to women. In 1903 a charter under the Great Seal of Ireland was issued by King Edward VII., which established the corporation of governors of the hospital, and defined their powers and duties. The hospital has had a very successful career, and having outgrown its old premises, has recently been provided with a new and commodious building from Sweepstake Funds. Up to the present the hospital has been managed by a body of governors co-opted as vacancies occurred. It is now proposed to make several important changes in the constitution, and to bring the hospital into direct relation on the one hand with University College, Dublin, and on the other with certain general clinical hospitals. At present the number of governors is limited to 65, but if the Bill becomes law this limit will be raised to 100. Of these governors 3 shall be nominated by the corporation of Dublin, 2 shall be nominated by the governing body of University College, Dublin, and 1 each shall be elected by the hospital from the staffs of Jervis-street Hospital, the Mater Misericordiæ Hospital, and St. Vincent's Hospital respectively. Provision is made for the appointment of an executive committee and the delegation to it of certain powers. The hospital is to be designated in future "The National Hospital for Women, Dublin." It is provided that the present master (Dr. J. F. Cunningham) shall continue in office until Dec. 31st, 1941.

THE KING'S PROFESSORSHIPS IN THE SCHOOL OF PHYSIC

On Feb. 7th the President and Fellows of the Royal College of Physicians of Ireland elected Dr. David Smyth Torrens to the King's professorship of the institutes of medicine in the School of Physic, Trinity College, Dublin, to fill the vacancy created by the death of Prof. Harold Pringle. Dr. Torrens has been for some time assistant professor of physiology in Trinity College. He was formerly lecturer in zoology in the Royal College of Science, Dublin. At the same meeting the resignation of Dr. Thomas Henry Wilson, King's professor of midwifery since 1910, was received with regret. Dr. Wilson's health has not been good in recent months.

OUTBREAK OF FIRE AT QUEEN'S UNIVERSITY, BELFAST

There was a serious fire at Queen's University, Belfast, on the afternoon of Feb. 7th. The part affected was the medical school, which is a large building situated close to others in the university grounds. The fire began in a storeroom under the anatomy lecture theatre, which is on the second floor. Students were at work in the dissecting-room nearby and on the ground floor a surgical lecture was in progress. So rapid was the spread in the few minutes before the brigade arrived that the building had to be evacuated, dense clouds of smoke pouring

from it. A strong wind was blowing and at one time it seemed as if the fire might spread to involve the whole building; but the efforts of the brigade were soon successful in confining it to the storeroom and the anatomy lecture theatre. Here the fire blazed furiously, the dry wood of the benches igniting readily, and before long flames were seen to be coming through the roof. In about an hour and a half, however, the fire was under control and subdued. It was feared at first that Prof. T. Walmsley's room and the laboratory in the tower would have been destroyed, but we understand that, apart from damage to the roof, there has been no other serious loss. Directly beneath the fire was the museum which contained a large and valuable collection of anatomical and pathological specimens. Though part of the ceiling was damaged by the fire breaking through in one place, it did not collapse and the contents of the museum were only slightly damaged. The building is now closed and in the hands of the salvage authorities.

CORRESPONDENCE

GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—Prof. Apperly's paper in your issue of Jan. 4th will have been read by many with interest, as it is both stimulating and provocative. By the time this reaches you I feel sure you that will have received letters from others who can refute from experience some of the assumptions that Prof. Apperly makes from indirect evidence. You may, however, feel that my experience, in another country, is also worth recording.

There must be a mass of evidence on record to contradict the statement that "When the former [the red cell content of the blood] falls to about half or two-thirds normal (on the average) free acid disappears from the stomach." You yourself have made a mild protest against this statement in an annotation in the same issue. I will quote only from a series of my cases that I am at the moment analysing; in a series of fractional gastric analyses on 33 Assam tea-garden coolies whose blood hæmoglobin content ranged from 17 to 45 per cent., mean 32 per cent. (100 per cent.=13·75 grammes per 100 c.cm.), in 27 the maximum gastric acidity (free) was from 25 to 90 c.cm. of N/10 hydrochloric acid per 100 c.cm., in 2 it was 20 c.cm., in 3 there was free acid but less than 20 c.cm., and in 1 case only was there achlorhydria (histamine not given). In this last case at the beginning of treatment the hæmoglobin was 29 per cent. (4 g.), but it improved to 80 per cent. (11 g.) when a trace of free acid appeared in one sample only (1½ hours) in the fractional gastric analysis.

Though I have always accepted the view that anæmia, per se, may lead to hypochlorhydria or even achlorhydria, recent experience adds very little support to this view; I will cite two cases actually in my wards at the moment: one is a case of hyperchlorhydria (maximum 75 c.cm. N/10 HCl) with 2·75 g. of hæmoglobin (20 per cent.), and the other a case of hypochlorhydric microcytic anæmia in which, though the hæmoglobin increased from 2·47 to 16·00 g. in three months, the maximum hydrochloric acid concentration only increased from 12 to 14 c.cm.

None of our experience in this country suggests that gastric acidity is diminished in a hot climate. The normal gastric acidity is higher than that usually recorded in England and North America (Napier and Gupta: Indian Jour. Med. Res., 1935, xxiii., 455). There are of course other factors to be considered, but all Indians do not live on the traditional highly spiced diet, nor is the evidence conclusive that a highly spiced diet leads to permanent hyperchlorhydria; it may lead to gastritis, the final result of which is hypochlorhydria or even achlorhydria.

Regarding the gastric acidity in asthma, there are many references in the literature (e.g., Hurst: Brit. Med. Jour., 1930, i., 1138; and Bray: "Recent Advances in Allergy," London, 1931), and it is generally claimed that the acidity is lowered; we (Dharmendra and Napier: Indian Med. Gaz., 1935, lxx., 301), however, found it increased; but admittedly our cases were not true allergic asthma nor was the analysis done at the time of an attack.

I am, Sir, yours faithfully,

L. EVERARD NAPIER, M.R.C.P. Lond.,
Professor of Tropical Medicine.

School of Tropical Medicine, Calcutta, Jan. 31st.

FAMILIAL CIRRHOSIS AND TELANGIECTASIA

To the Editor of THE LANCET

SIR,—I was much interested in Dr. Parkes Weber's paper on the familial tendency to development of hepatic cirrhosis and more especially in his reference to the relationship between cirrhosis and telangiectasia of the Osler type. As Dr. Weber points out there have been many valuable papers on this disease, particularly by H. I. Goldstein, but it is remarkable how few members of the profession are familiar with the condition. In a letter to THE LANCET (1933, i., 116) Goldstein said that there are "probably recorded to date about 110 or 120 families and about 700 persons suffering from Rendu-Osler-Weber's disease (heredofamilial epistaxis with or without familial hæmorrhagic telangiectasia) in the entire available medical literature of the world." When one considers that Osler's original paper was written in 1901 (and a family showing epistaxis was described by Babbington in 1865) and, further, that cases have been reported from all over the world, these figures are undoubtedly very small if they truly represent the incidence of this disease. From personal experience I have thought for some time that the figures must be fictitiously low. During the past six years I have personally observed 10 families suffering from this disease, including in their number 56 affected persons; all these people live in the West Riding of Yorkshire and as far as I have been able to trace them the families are unrelated and have not been previously recorded. The wealth of clinical material in Leeds is certainly remarkable, but it is very unlikely that about 10 per cent. of all the cases of familial telangiectasia in the world are living in the West Riding. A considerable number of my cases have shown that the profession as a whole is unfamiliar with the condition and though several of the patients have been transferred to me by Dr. J. T. Ingram, others have come as cases of anæmia of unknown origin, epistaxis, and even headache.

The association of telangiectasia with hepatic cirrhosis is of great interest and I agree with Dr. Weber that the telangiectasia is probably a congenital-developmental dysplasia of the small blood-vessels, and that the cirrhosis may be the result of associated developmental dysbiotrophy of the liver. At the same time there can be no doubt that cirrhosis is not an essential feature of this disease at any of its

stages, and I have not yet seen a patient showing any suggestion of liver disorder. There is, however, a possible relationship between familial telangiectasia and neurofibromatosis, and I have seen a family suffering from the latter condition in whom there are several affected persons also suffering from unexplained epistaxis; at the same time I have not found any definite evidence of neurofibromatosis in patients suffering from telangiectasia, although I have thought that the incidence of skin tags, patches of pigmentation, and other slight abnormalities of the skin is higher than usual in these people. If there should prove to be any relationship between hepatic cirrhosis and familial telangiectasia it is important to remember that the latter disease is recognised as being one of the most regularly inherited Mendelian dominant defects in man, and in my own large series of cases, with the exception of one or two sporadic cases of doubtful significance, I have found no exception to this rule.

I have recently satisfied myself that this condition of telangiectasia is radiosensitive and that the epistaxis can probably be cured by radium. This will prove to be important, as the disease may, and frequently does, produce completely disabling anæmia which can only be relieved when the epistaxis is arrested.—I am, Sir, yours faithfully,

Leeds, Feb. 10th. HUGH G. GARLAND.

SODIUM MANDELATE IN CHRONIC CYSTITIS

To the Editor of THE LANCET

SIR,—A personal record of the effect of various urinary antiseptics upon chronic cystitis may be of interest to some of your readers. My catheter life began in 1932, at the age of 72, after an attack of acute retention. In spite of the most careful asepsis, the urine became infected with *B. coli* and, on the advice of a urologist, I dispensed with the use of the catheter. It was at this time that I started my experience of various urinary antiseptics, samples of urine being sent regularly for bacteriological examination to Mr. A. E. Parkes, F.I.C., public analyst for Poplar, West Ham, and Bethnal Green. I found that hexamine, citrates, bicarbonates, and sodium acetate, benzoate, and salicylate were not readily tolerated, but hexyl resorcinol and Pyridium both proved of value, the latter being very soothing to an irritable bladder. Organisms, however, were constantly present though with pyridium there were occasionally as few as 10 bacilli present per c.cm.

In November, 1935, I began a course of sodium mandelate (3·5 g.) and ammonium chloride (1 g. cachet) four times a day, restricting my fluid intake to two pints. The immediate effect of this remedy was to produce a nocturnal diuresis. Despite some thirst, anorexia, and nausea, I persisted with the treatment for 13 days, and the complete disappearance of bacteria from the urine made the discomfort worth while. Five weeks later, following exposure to cold —I went to vote—I had another attack of cystitis and of acute retention necessitating catheterisation and the infection probably recurred. Sodium mandelate was again taken on Nov. 22nd and 23rd, but this time I decided to reduce the dose of ammonium chloride to 1×1 g. cachet daily, and this proved sufficient to make the urine acid to methyl-red. Nevertheless, the treatment caused some strangury and after two days it was stopped. Once more, however, it must have proved capable of destroying the organisms, for a sample of urine was taken next day (Nov. 24th) and no *B. coli* could be grown from 1 c.cm. Now, 13 weeks later, though there is still two ounces of residual urine and sometimes more, necessitating catheterisation night and morning, the urine is quite clear and bright and I am comfortable and practically symptom-free. (I started catheterisation again on Nov. 17th after 15 months without passing a catheter at all.)

Mr. Parkes carried out some experiments on the mandelic acid content of the urine. From one specimen of 10 c.cm. he extracted 20 mg. of mandelic acid, which indicates a concentration of 0·2 per cent., and he was able to show that at 37° C. a 0·1 per cent. solution of pH 4 of the acid in urine was fatal to *B. coli* in one hour, though a 0·007 per cent. solution had no effect in two hours.

The chief lessons I have learnt are that 1 g. only of ammonium chloride per day is sufficient to acidify my urine, and that sodium mandelate taken for 2–3 days whenever the urine becomes cloudy clears up the infection. The comfort of having got rid of the urinary infection cannot be expressed. After I had spent a small fortune trying other remedies, sodium mandelate finally did the trick and, up to the present, has given me a new lease of life.

I am, Sir, yours faithfully,

Teddington, Feb. 9th. F. W. ALEXANDER.

CARD PARTY FOR MEDICAL CHARITY

To the Editor of THE LANCET

SIR,—In your issue of Feb. 8th I note you have a record on p. 329 of the case Williams *v.* Trevor, but this account does not include the final statement of counsel or the remarks of the judge. Will you please insert in your next issue that statement, which was as follows:—

Sir William Jowitt said he desired to apologise for a mistake he made in opening the case. In all newspapers he was reported as having said that the card party was "for the benefit of the Ivory Cross National Dental Aid Fund of the Royal Northern Hospital." The Dental Aid Fund was quite distinct from the Royal Northern Hospital and nobody connected with the hospital figured on the invitation card.

Mr. Justice Finlay said: "There can be no doubt that the president and officers of the eminent charity concerned knew nothing about it."

I am, Sir, yours faithfully,

GILBERT G. PANTER,
Secretary, Royal Northern Hospital.

Holloway, N.7, Feb. 11th.

ACETYLCHOLINE FOR PAROXYSMAL TACHYCARDIA

To the Editor of THE LANCET

SIR,—In an article in your issue of Dec. 7th, 1935 (p. 1291), I quoted Dr. Isaac Starr Jr., of the University of Pennsylvania, Philadelphia, as having used acetylcholine in a series of cases of paroxysmal tachycardia. I have since received an interesting letter from Dr. Starr, in which he says, amongst other things:—

"I write to try to clear up a point which I am afraid may cause serious difficulty if it is not appreciated. You speak of me as having described the termination of paroxysmal tachycardia after subcutaneous injections of acetylcholine. This is not correct. I used acetyl-β-methylcholine, trade name, Mecholyl, made by E. Merck (Darmstadt). Given subcutaneously this is somewhere between ten and twenty times as powerful as acetylcholine. Like yourself, I have never seen any unpleasant sequelæ after injecting acetylcholine in the dosage you gave. Indeed doses of this size are seldom followed by demonstrable drug effect. On the other hand an injection of 75 mg. of acetyl-β-methylcholine to a boy of 14 would probably have produced enough vagus effect to stop the heart altogether and I would make no guarantee that it

would resume. I hope you will do what you can to get the different pharmacological effects of the many active choline derivatives straightened out in the minds of the physicians. I am very fearful that someone may use acetyl-β-methylcholine in the dosage proper for acetylcholine subcutaneously. If so, I hope they have atropine ready at hand."

I hope the publication of this letter will be an appropriate warning; and I should like to take this opportunity of apologising to Dr. Starr for having misquoted his work.—I am, Sir, yours faithfully,

A. B. STENHOUSE.

Radcliffe Infirmary, Oxford, Feb. 10th.

CHILD BORN WITH A FOREIGN BODY IN THE HEART

To the Editor of THE LANCET

SIR,—We are fully aware of the incredible nature of this case, but feel impelled to place on record what we believe to be an occurrence unique in the annals of pathology.

A female child was born at term to a primipara who had an uneventful gestation and a normal labour. The baby also appeared normal in every way, but died suddenly some hours after birth, and for no apparent reason. A post-mortem was ordered, and this was carried out with meticulous care by one of us (T. T. W. E.) in the presence of the other (W. M. C.), who was assisting and observing closely, as the case was his, there being no professional connexion between us. The mortuary attendant was also a witness. Nothing of importance was observed until the heart was removed, laid beside the body on the post-mortem slab, and dissected with a scalpel and a pair of surgical scissors, which were unplated. On opening the right ventricle, a small, bright object was seen lying free within the cavity, and was extracted under three pairs of curious eyes. It was a small piece of metal resembling brass or gilded tin, appearing to be a circlet of sorts, folded upon itself, with regular serrations along its edge, and measuring roughly 3 by 2 mm. It looked something like the claw setting of a toy jewel ring such as is found in Christmas crackers.

We emphasise that there was no possibility of its having been dropped by one of us as we bent over the heart; of its having been shed by one of the instruments used; or of its having been picked up from the post-mortem table. We very naturally examined these possibilities critically before ruling them out. The explanation of its presence, forced upon us by exclusion, seems as fantastic as the discovery itself; but we would welcome alternative suggestions. It is, that the foreign body was lying within the mother's uterus at the time of conception and that the growing ovum enfolded it, so that it finally came to lie where it was found. When the placental circulation ceased and the child's heart "took over," it caused some momentary effect which produced syncope.—We are, Sir, yours faithfully,

T. T. W. EATON,
W. MULHALL CORBET.

Canvey Island, Feb. 8th.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Rear-Admiral John S. Dudding, C.B., O.B.E., K.H.P., has been placed on the Retd. List at his own request on relinquishing charge of the R.N. Hospital, Plymouth, where he has served for three years. Surg. Rear-Admiral Francis J. Gowans, who in 1933–35 was in medical charge of the hospital ship *Maine* has succeeded him.

Surg. Comdr. W. G. C. Fitzpatrick to *Vernon*.

Surg. Lt.-Comdr. V. G. Horan, M.B., to *Pembroke* for R.N. Hospital, Chatham.

Surg. Lt.-Comdr. (D.) S. Mawer to *Drake* for R.N.B.

Surg. Lt. (D.) W. J. Wolton to *Hood*.

Surg. Lt. E. J. Littledale to *St. Vincent*.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Sub-Lts. to be Surg. Sub-Lts.: R. T. May, P. de B. Turtle, R. F. B. Bennett, C. P. Nicholas, and L. S. Anderson.

ARMY MEDICAL SERVICES

Lt.-Col. S. W. Kyle, from R.A.M.C., to be temp. Col. while employed as A.D.M.S., 5th Div.

Lt.-Col. R. M. King, from A.D. Corps, to be Col.

ROYAL ARMY MEDICAL CORPS

Capts. G. Anderton, R. J. G. Hyde, and R. V. Franklin to be Majs.

Capt. N. H. Lindsay, h.p. list, is restd. to the estabt.

The results are announced of the examination (in written subjects) of officers with a view to promotion in the Regular Army, Indian Army, and Dominion Forces, which was held at stations abroad (excluding India) last October. Among the successful candidates were Capts. T. F. M. Woods and M. R. Burke, R.A.M.C., and Maj. J. E. A. Tessier, Royal Canadian Army Medical Corps.

ARMY DENTAL CORPS.

Maj. J. S. Smith to be Lt.-Col.

TERRITORIAL ARMY

Col. P. H. Mitchiner, T.D., K.H.S., from A.D.M.S., 47th (2nd Lond.) Div., is attd. to the 1st Anti-Aircraft Div. for duty as A.D.M.S.

Lt.-Col. W. A. Robertson, M.C., from R.A.M.C., to be Col. and is apptd. A.D.M.S., 51st (Highland) Div.

Lt.-Col. and Bt.-Col. W. A. Robertson, M.C., from T. A. Res. of Off., to be Lt.-Col. and relinquishes the Brevet rank of Col.

Lts. H. C. Stewart and P. Brookes to be Capts.

Col. R. E. Bickerton, D.S.O., T.D., from 56th (1st Lond.) Div., to be Hon. Col., R.A.M.C. Units, The Lond. Div.

The surname of Lt. J. L. Cowan, M.D., M.R.C.P. Edin., is as now described and not as notified in the *Gazette* of Jan. 24th, 1936.

J. R. Dawson to be Lt.

ROYAL AIR FORCE

Wing-Comdr. J. Kyle to Medical Training Depôt, Halton, for duty as Commanding Officer, vice Group Capt. E. W. Craig, M.C.

Flight Lts. J. Hutchieson and C. A. Lewis to R.A.F. General Hospital, Hinaidi, Iraq.

Flight Lt. J. Hill is promoted to the rank of Squadron Leader.

Flying Offrs. H. L. Willcox, R. A. Cumming, and L. E. A. Dearberg to R.A.F. General Hospital, Hinaidi, Iraq; S. R. C. Nelson to Central Medical Establishment, London.

Flying Offr. W. G. S. Roberts is promoted to the rank of Flight Lt.

DEATHS IN THE SERVICES

The death occurred in London on Feb. 4th of Major ARTHUR EDWARD MILNER, R.A.M.C. Born in 1867 he was educated at Bristol and Guy's Hospital, where he was Clark scholar in surgery and Saunders scholar in medicine. After taking the conjoint qualification in 1892 he won the Montefiore prize in military surgery at Netley, and entered the Army as a surgeon lieutenant. He became captain in 1897, major in 1906, seeing service on the N.W. frontier of India and with the Tirah Expeditionary Force, when he was awarded a medal with 2 clasps. In the South African War he took part in operations in Natal and at the defence of Ladysmith, gaining the Queen's medal with 3 clasps. He was placed on retired pay in July, 1914, but a month later was recalled to the active list.

PUBLIC HEALTH

MENINGEAL TUBERCULOSIS

EPIDEMIOLOGY AND TYPE OF TUBERCLE BACILLI

By W. T. Munro, M.D. St. And., F.R.C.P. Edin.
MEDICAL SUPERINTENDENT, GLENLOMOND SANATORIUM, KINROSS; AND
Harold Scott, M.B. St. And.
ASSISTANT MEDICAL OFFICER AT THE SANATORIUM

In 1932 Dr. Stanley Griffith [1] reviewed the relative incidence of human and bovine tubercle bacilli in meningeal tuberculosis in England. Most of these viruses were obtained from Leeds and the surprising feature was that 10 out of 30 specimens of cerebro-spinal fluid yielded bovine type bacilli. In a later communication [2] he dealt with 214 English and 37 Scottish cases. The former yielded 52 (24·3 per cent.) bovine types, while the latter yielded 15 (40·5 per cent.). The English cases were from widely different localities. From Leeds one noted 10 bovine infections among 49 city cases (20 per cent.) and 8 bovine infections among 17 rural cases (47 per cent.). Throughout this report there was a higher incidence of bovine types in rural areas.

The Scottish cases reported by Dr. Griffith in this review included 18 of the present series with 33 per cent. bovine types; 15 from Aberdeen with 47 per cent. bovine types; and 4 from Ayr with 50 per cent. bovine types.

Dr. Agnes Macgregor has since reported [3] that 14 out of 50 cases of meningeal tuberculosis in Edinburgh (28 per cent.) could be ascribed to bovine bacilli; only 8 of these 50 lived in rural areas and 3 of these were infected with the bovine type. Dr. Blacklock [4] states that 12 out of 60 cases in Glasgow (20 per cent.) yielded bovine bacilli, and notes that the bovine percentage was higher in country (27) than in city (18) children.

The series here described comprises cases of meningeal tuberculosis from Glenlomond Sanatorium admitted from year 1924 to date, and specimens of cerebro-spinal fluid sent us between 1932 and 1935 from the wards of the Royal Infirmary, Dundee, by Prof. A. Patrick, Dr. James Thomson, and Dr. Gordon Clark, to whom we are much indebted for information. Specimens of cerebro-spinal fluid from 59 cases have been examined. Meningeal tuberculosis is not an uncommon mode of death in cases of chronic pulmonary tuberculosis and 9 of the specimens examined were from such patients. These were all adults whose sputa yielded us eugonic growths of typical human types and similar types were also grown from the cerebro-spinal fluids. These 9 cases are not included so that we limit our review to cerebro-spinal fluids from 50 patients who came under observation on account of symptoms suggesting meningeal involvement.

In our earlier cases no attempt was made to obtain growths direct from the cerebro-spinal fluid and the fluid was injected into a guinea-pig. In later years, as we became more certain of growth, direct inoculation of suitable media became the rule and was carried out as well as inoculation of a guinea-pig. In all, 27 were obtained by direct inoculation, while the others were obtained solely by inoculation of a guinea-pig.

DISTRIBUTION OF CASES

Of the 50 cases 14 were from Glenlomond and 36 from the Royal Infirmary, Dundee. Of the Glenlomond cases 7 and of the Dundee cases 11 proved bovine in type. Glenlomond Sanatorium receives its patients from the counties of Fife and Kinross, but exclusive of the large burghs of Kirkcaldy and Dunfermline; so that apart from some smaller burghs the patients are drawn from purely rural areas.

Of the Dundee patients 4 (in each of whom the virus was found to be bovine) came from rural areas—viz., 3 from rural Perthshire and 1 from a rural district of the county of Angus. No human type Dundee case came from a rural area, so that, all told, 18 cases came from rural areas and yielded 11 bovine types, while 32 cases were urban and yielded 7 bovine types.

Tuberculosis in the human subject due to bovine bacilli is much more a rural than an urban problem and this aspect will be more in evidence as facts are elicited in this paper.

CULTURAL CHARACTERISTICS AND PATHOGENICITY

Of 50 strains, 18 (36 per cent.) exhibited the cultural characteristics of the bovine type bacillus while 32 were identical with the eugonic human type bacillus.

Before acceptance of a dysgonic moist-looking growth as being a bovine type a pathogenicity test has always been carried out, and the test used by us is the intravenous inoculation of a rabbit of about 1500 g. weight with 0·01 mg. of the wet virus. A bovine strain will kill the rabbit in approximately thirty days, the lesions being those of progressive generalised tuberculosis, while the human strain in the same dose will scarcely ever kill the rabbit and certainly not in less than 90 days, and as a rule produces only minimal non-progressive lesions. All the dysgonic types proved fully virulent to the rabbit and were true bovine types. Moreover, all these viruses were examined at Cambridge by Dr. A. Stanley Griffith and accepted as bovine types.

Table I. shows the age-distribution according to type.

TABLE I

—	Total.	Human.	Bovine and per cent.
0– 5 years	20	9	11 (55)
5–15 ,, ...	18	14	4 (22·2)
Over 15 ,, ...	12	9	3 (25)
—	50	32	18 (36)

These figures do not surprise us in any way. We were quite prepared for a high percentage of bovine types in the age-group 0–5 years. All the children under two years of age who showed disease due to the bovine type bacillus had been fed on cow's milk unboiled.

Noteworthy too is the number of bovine types found in persons over 15 years. The oldest in the series was the case of a ploughman of 30 years of age.

RURAL AND URBAN DISTRIBUTION

When we come to separate our cases by a rural and urban distribution, we meet with some very significant facts as shown in Table II.

It will be seen that there is a big difference in the percentage of bovine infections in rural and urban areas. This is to be expected, for there is no pasteurisation of milk in rural areas and no dilution of infection by bulking. In Dundee about 60–70 per cent. of the city's supply may be considered safe,

whereas it is doubtful if any rural supply can be considered safe apart from milk from a tubercle-free herd. The significant fact is that the incidence of

TABLE II

—	Urban.		Rural.	
	Human.	Bovine.	Human.	Bovine.
0– 5 years	9	5	—	6
5–15 ,, ...	11	2	3	2
Over 15 ,, ...	5	—	4	3
Total	25	7	7	11
Percentage bovine ..	—	21·9	—	60·1

bovine types is three times greater in the rural areas than in the city. The only protection in rural areas is to boil the milk.

EPIDEMIOLOGY

The Tables show that the rural population supplies us with far the greater proportion of our cases due to the bovine bacillus. Even in the later age-periods we find cases of meningeal tuberculosis due to the bovine type from rural areas. Dr. Griffith reports the case of a man of 32 years of age from Lincolnshire whose cerebro-spinal fluid yielded a bovine virus and the oldest case in our series is that of a ploughman, 30 years of age, from Perthshire; while we can also show the cases of a youth of 19 from Fifeshire and a girl of 17 from Perthshire, from each of whom bovine types were obtained. Ploughmen in Scotland usually receive milk from the farm as part payment, and the question of compensation might reasonably arise if disease due to the bovine bacillus was found to be the cause of death. The difficulty would be to fix the actual source of the infection. Ploughmen do not remain long in one service.

In the prevention of tuberculosis, one of us has previously stressed the fact that after notification of a case of meningeal tuberculosis the family must be carefully reviewed, especially to ascertain if there is a case of pulmonary tuberculosis or other visceral tuberculosis in the household. If no other case of tuberculous disease is found, full inquiry as to the source of the milk-supply must be made.

With regard to the cases from Fife county, it was easy for us to get all the facts. In every instance where a human type virus was found in the cerebro-spinal fluid there was, or had been, a known case of pulmonary tuberculosis in the home. With regard to the bovine types from Fife county, the discovery of so many cases of pulmonary tuberculosis due to the bovine type virus makes us keep in mind that we must be careful to review the whole family even if we do know the virus from the cerebro-spinal fluid is bovine in type. In no case due to the bovine type from Fife, however, did we find anyone with visceral tuberculosis in the home, and so in these cases we were forced to regard the milk-supply as the likely source of infection.

In recent years it has been our practice to notify Dr. G. Pratt Yule, medical officer of health of Fife, at once whenever we have found bovine type in a cerebro-spinal fluid. From the cases notified, Dr. Yule has been able to find an offending cow in two instances. We were much disappointed to be unable to find the source in the case of an eight months' old child whose virus was bovine in type. Careful examination of the herd by the county veterinary officer failed to reveal disease in any cow and a biological test of the milk proved negative.

Urban cases.—When we come to consider the epidemiology of the cases from Dundee, we confine our inquiries to those cases in which a bovine virus was obtained. We are indebted to Dr. John Hunter, tuberculosis officer, Dundee, for his help in obtaining full information about these cases.

In Dundee there are two large companies which pasteurise milk and over 50 per cent. of the city's supply is pasteurised, while 10 per cent. will be from tubercle-free herds; so that probably between 60 and 70 per cent. of the supply will be safe. There are many deliveries from the churn by cart and there are a few dairies in the city where cows are bought in and milked till dry and then sold. These cows never go out from the byre.

In 11 instances the bovine type virus was found. The family history in one case revealed that the father suffered from pulmonary tuberculosis and tubercle bacilli of human type were obtained from his sputum; he had also had extensive tuberculosis of the cervical lymph nodes ten years previously. This finding is in keeping with those cases described by Walker [5] when he reviewed the lack of evidence of human-to-human infection by the bovine type. In this case there was opportunity of infection by milk as the supply was not from a safe source.

In one other case there was a history that the father had had a hæmoptysis, but no sputum ever was obtained.

In every case the milk-supply was from a doubtful source and there was a common dairy in three instances. This information has been passed to the medical officer of health and we learn that this dairy buys in milk for sale. It will be most difficult to overtake a complete examination of the cows in such a circumstance.

IS THE PRESENT LEGISLATION SUFFICIENT FOR THE EXAMINATION OF COWS?

The 1914 Milk and Dairies Act is the Order under which a local authority can act. This is supplemented by the Tuberculosis Order, 1925. These appear to us to be utterly insufficient and the faults lie in two places.

Firstly, the definition of a dairy is too restricted. The term includes any creamery, farm, &c., from which milk is sold or supplied for sale, but excludes premises where cows are kept solely for the use of the farmer and his servants, or where milk is sold to a very limited number of neighbours. Therefore such premises need not be registered and there is no inspection.

With the knowledge that deaths have occurred among farm servants, and that cervical lymph-node tuberculosis is not uncommon among farm servants' families, being often due to the bovine type bacillus, it is obvious that all places where milk is obtained should be inspected. This is not meant to imply that the farmer is careless as to milk-supply to his staff. For example:—

> A farmer residing a few miles from Glenlomond Sanatorium purchased a cow as sound, the milk to go to his staff. The farm grieve and his wife did the milking and noted at once a slight induration in one quarter. The cow was again examined and passed as sound, but the grieve brought the strippings of the indurated quarter here for examination and numerous tubercle bacilli were found. On report of this the farmer had the animal destroyed at once and examination revealed extensive tuberculous disease.

The farmer who merely keeps cows to supply milk to his staff would, we feel sure, not knowingly retain an unsound cow, but there ought to be inspection.

The second serious defect in the Order lies in the qualification of disease in the cow. The cow-keeper must report to the local authority if a cow (1) has a chronic cough, (2) is emaciated, or (3) has disease or induration in an udder. But these, surely, are terminal features? A cow in any such state, if tuberculosis is the cause, will have done all the damage she can do, and we can hardly think that the dairy farmer only suspects when any of the above-mentioned states is present. And the amazing feature in the Order follows. If the dairy farmer reports such an animal to the local authority and on inspection tuberculosis is found he is compensated. It is very different with other tradesmen. A sale of adulterated foodstuffs is punishable but the farmer is compensated if he notifies an unsound beast.

These Orders do not deal with the problem at all, but leave it possible to profit by the sale of unsound milk and subsequently by notification of the unsound cow.

CONCLUSIONS

Of 50 cases of meningeal tuberculosis 18 (36 per cent.) were attributable to bacilli of bovine type. Rural cases give 60 per cent. of bovine types while urban cases yield 22 per cent. Taking the figures for Fife alone, we find that 7 out of 14 (50 per cent.) are of bovine type—a figure which probably gives a better idea of the actual position. Tuberculosis due to the bovine type is an urgent rural problem, and the present legislation is inadequate.

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Medical Inspection in American Schools

IT is a common experience to meet a friend just returned from a foreign country full of enthusiasm for its wonderful organisation, and soon after another who has nothing to tell but of its backwardness and deplorable conditions. Strangely contradictory accounts have been given of the state of school medical work in America and the discrepancies may be resolved by study of a searching review by Dr. J. F. Rogers, of Washington, in the *Quarterly Bulletin* of the League of Nations Health Organisation. The degree of efficiency ranges from organisation such as that in New York State to that in Illinois. In New York State there is a director with a central staff of eight: (1) a general supervisor of medical inspection; a supervisor of (2) sight and hearing; (3) oral hygiene; (4) heart and lungs; (5) psychiatry; (6), (7) two supervisors of school nursing; and (8) a supervisor of health for teacher-education institutions. The outside staff consists of 1300 school medical inspectors and 600 nurses. The inspectors have had special post-graduate training in the principles of health education and in its organisation in public schools. The nurses, after full training, have all taken an approved course in health education. There are besides many trained dental hygienists working under the dentists. In Illinois there is no legislation on the subject at all, and this is the case in 5 other States; although in some of these there may be good systems of examination in certain schools. In 27 the law is mandatory, in 13 it is merely permissive. The inspections are carried out in 3 States by the county health officer, in 5 by a physician, in 9 by a physician or a nurse, in 6 by a physician or a teacher, in 5 by a physician, teacher, or nurse, in 3 by a nurse, in 7 by a teacher, and in 2 by a dentist only. Obviously a teacher cannot make a full medical examination but he may recognise defects such as those of sight and hearing, and in some places teachers are given specific instruction in the detection of gross defects.

On the credit side of the account must be put the fact that in 20 States the examinations are annual—a frequency which is being advocated by some reformers in this country. Against this must be set the fact that in only 14 States is there a full general medical examination. In general the object of the inspection is to remove obstacles to education rather than to promote better health and physique. The school medical officer who has graduated in public health is nearly non-existent. The administration is more often conducted by the education department than by the health authority, and this bias is increasing; there is something to be said for it if it is true that there is less of politics in the work of education than of public health and hence a more secure tenure of office and personnel. The examinations are looked upon as educational in another sense; they teach the children, and perhaps their parents, the value of periodic medical supervision and may lead to the habit of seeking it in later life. Instruction in hygiene does not appear to be widely organised.

Special schools for the blind and partially blind, for the deaf and hard of hearing, for the crippled and the delicate, are highly developed in some States and non-existent in others. Some types of special schools—e.g., those for the partially deaf—can, we believe, be definitely traced to the example of our own country. Treatment facilities vary greatly. A common practice is just to inform a parent that the child "seems to be suffering" from some abnormal condition. Apart from dental clinics there are few treatment centres, and even within the boundaries of New York State the proportion of defects treated varies from 15 to 95 per cent.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 1ST, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2509; diphtheria, 1304; enteric fever, 27; acute pneumonia (primary or influenzal), 1605; puerperal fever, 52; puerperal pyrexia, 101; cerebro-spinal fever, 27; acute poliomyelitis, 6; encephalitis lethargica, 3; dysentery, 52; ophthalmia neonatorum, 65. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 7th was 4233, which included: Scarlet fever, 1089; diphtheria, 1096; measles, 693; whooping-cough, 681; puerperal fever, 17 mothers (plus 13 babies); encephalitis lethargica, 281; poliomyelitis, 4. At St. Margaret's Hospital there were 24 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 41 (5) from measles, 4 (0) from scarlet fever, 25 (2) from whooping-cough, 46 (8) from diphtheria, 58 (21) from diarrhœa and enteritis under two years, and 98 (19) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is maintained, the total deaths for the last nine weeks (working backwards) being 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 46 great towns, Birmingham reporting 9, Manchester 5, Bradford 4, Leeds 3, no other great town more than 2. Liverpool had to report 11 deaths from measles, Salford 5, Sheffield and Warrington each 3. Liverpool also reported 5 deaths from whooping-cough, Birmingham 3. Deaths from diphtheria were reported from 29 great towns: 3 each from Hull, Liverpool, and Plymouth, 2 each from Bradford, Manchester, and Birmingham.

The number of stillbirths notified during the week was 251 (corresponding to a rate of 42 per 1000 total births), including 31 in London.

OBITUARY

SIR CHARLES BALLANCE

THE death occurred on Saturday last of the distinguished surgeon and neurologist, Sir Charles Ballance; he was 79 years of age and had been recently in a delicate state of health. A notice of his life will appear later. The following tribute to him as man and worker has been received from Sir Charles Sherrington: "As one who knew Sir Charles Ballance and in earlier years saw him much I gladly accept the suggestion to pay his memory, at this time of our loss, some tribute in words even if brief. Between the years 1887 and 1895 at St. Thomas's Hospital medical school, Ballance, and with him Walter Edmunds, was a colleague who, I might say literally, frequented the physiological laboratory. Among other research which the two did there were their experiments on the bursting strain of arteries. Also at the Brown Institution, which was under me in those days, they did work on the thyroid and the results of its extirpation in the monkey.

"For Ballance in those years any hour up to 10 o'clock in the evening might bring him. He used to smile and say, 'at home they have yet to understand that I like my coffee cold!' The microscope would occupy us sometimes until after midnight. He was interested in an experimental study as to the source and behaviour of the cells which repair after inflammation. He would be so keen in following the movement of the cells that he would read 'motives' into their behaviour. In Walter Edmunds he had an admirably objective collaborator. Their tracing of how the tied artery becomes structurally closed when and where ligated in continuity without rupture of its coats stands as a monument to their admirable collaboration.

"A colleague with whom in those years, and after, he did much research was Samuel Shattock. At the period I am alluding to they were engaged in a quest for possible parasitic protozoa in cancer. They conducted the search with attempts at culture as well as by microscopic examination of the cancerous tissue. I was privileged to look on at times, and the pains taken, the long patience shown, the scrupulous loyalty to results dishearteningly negative were an example to remember. Ballance had an enthusiastic admiration for Shattock's great knowledge of and experience in morbid macro- and micro-anatomy. He would compare, and prefer, him to Rudolf Virchow, and add, 'Shattock will never disappear into politics!' a remark with which it was not difficult for all who knew Shattock, and that he carried habitually with him a copy of St. Francis of Assisi, to concur.

"After removing from London I had to my regret far less opportunity of seeing Ballance. When I did he always renewed just the same frank friendship. His enthusiasm for laboratory research in surgery did not diminish. He had undertaken his experiments on nerve-suture and nerve-grafting and the repair of nerves. The experimental work by David Ferrier always remained a source of inspiration to Ballance. He appraised Ferrier's work on the removal of portions of the brain in apes as the actual pioneer-step leading to modern cerebral surgery. He followed with intense interest the recent developments by his own college, the Royal College of Surgeons of England, in providing facilities for experimental research in surgery—namely, the field laboratory at Down, in Kent, and the installation of experimental laboratories in the College itself.

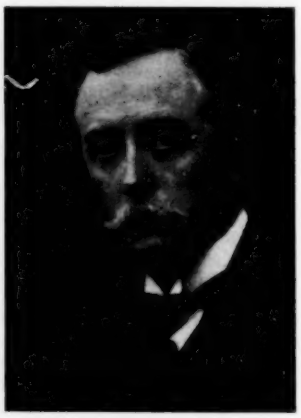
"If as he grew older he seemed a little liable to 'preach' somewhat, this is explained by the fact that the theme of which he never tired was experimental research in surgery. Ballance was sincerity itself. A scrupulously conscientious man, on the invasion of Belgium by Germany in 1914 he took the German decoration, bestowed on him some years before, to the Thames Embankment and flung it into the river, an incident he would relate with a short laugh of satisfaction. In 1933 he was awarded the Lister Memorial medal and gave the Lister Memorial lecture. This latter give him opportunity to report upon and to demonstrate some of his latest work, done with junior colleagues, on nerve-grafting. The award and the occasion were a profound satisfaction to him. Those who were present are not likely to forget the impression he conveyed to all there of what he stood for."

WILLIAM HENRY BATTLE, F.R.C.S. Eng.

CONSULTING SURGEON, ST. THOMAS'S HOSPITAL

THE death occurred early on Sunday morning, Feb. 2nd, of William Henry Battle, consulting surgeon to St. Thomas's Hospital, following an illness of several months' duration.

Born in Lincoln in 1855, the son of Mr. F. R. Battle, an alderman of that city, he was one of a family of nineteen children. He received his general education at Lincoln Grammar School and entered St. Thomas's Hospital in 1873. He was a successful student, a prizeman and Solly medallist, and obtained the diplomas of M.R.C.S. Eng. and L.S.A. Lond. in 1877. He served a fine apprenticeship to his later position on the staff of St. Thomas's, being house physician, house surgeon, and resident accoucheur. In 1880 he took the diploma of F.R.C.S. and became surgical registrar at the hospital, proceeding to the position of resident assistant surgeon. At the same time he began a long connexion with the Royal Free Hospital by appointment to the staff as assistant surgeon and demonstrator of practical surgery in the School of Medicine for Women. He continued his early obstetric work by acting as surgeon to the Dispensary for Women in Shadwell and was also appointed to the staff of the East London Hospital for Children.



MR. BATTLE

[*Photograph by Beresford*

In 1892 Battle became assistant surgeon to St. Thomas's Hospital, and in that year, in succession to Sir John Tweedy, he joined the staff of THE LANCET as general surgical adviser. Such was the arrangement of work within the office of THE LANCET in those days that this post implied the editing of a department entitled A Mirror of Hospital Practice, a section of the paper that was much developed by Tweedy. It entailed the personal visiting of the

operating theatres in London on certain days, as well as the securing of reports from the theatres of large hospitals without the metropolis. Already when Battle succeeded to the work its design, framed in an era when operations were few and when it was possible to relegate their performance to particular hours of the week, had become ill-defined, for the task of anything like inclusive reporting could not be attempted. Thus under Battle's editorship the Mirror of Hospital Practice changed in character and became a method of personal approach by the paper to authors whose contributions would be obviously valuable to our readers. In this way Battle served the paper well, while it was his habit, following that of Tweedy, to precede the accounts of the operations reported with historical notes of analogous cases or of similar displays of technique, such as to-day are very usually furnished by the authors themselves in relation to their communications. The provision of these notes, which sometimes formed a ground-plan for longer articles, came the easier to Battle, in that he had been editor for two years of the surgical reports of St. Thomas's Hospital and a frequent contributor to those reports. He seldom recorded in the Mirror of Hospital Practice any work of his own, but he published in our columns, in the *Transactions* of the Pathological Society and in those of the Clinical Society, numerous articles dealing with a large range of clinical subjects.

In 1890 Battle was appointed a Hunterian professor at the College of Surgeons, and delivered a valuable series of lectures on injuries to the head. The composition of these lectures entailed upon him investigation of a large number of recorded cases, and the work, carried out with judgment and acumen, brought together in readable form a great deal of valuable information. In 1906, now full surgeon to St. Thomas's Hospital and the Royal Free as well as joint lecturer in practical surgery at the former institution, he gave a course of clinical lectures at St. Thomas's, entitled the "acute abdomen," in which he pointed out in a detailed manner the difficulties presented in diagnosis, and therefore in the first stages of treatment, presented by cases of appendicitis, intestinal obstruction, intussusception, perforations in the alimentary tract, and gynæcological inflammation. His personal knowledge ranged almost from the time when operative interference in these spheres was contemplated only as a last resource, so that he was able to tell the full story in a graphic manner.

In addition to these lectures and reports he wrote, in collaboration with Mr. E. M. Corner, a practical treatise on the appendix and its surgical complications. The work attained to a second edition and marked the great interest with which Battle had always followed the development of abdominal surgery. Its publication added to his high claims to prominence as a surgeon. "In my opinion," writes Mr. Corner, "he was unequalled for dexterity and clever manipulation in abdominal conditions. His ingenuity and boldness were justified by good results. He could on necessity be extremely quick and when the unexpected happened he was never disturbed, for his skill and experience allowed him to adapt procedure in accordance with emergencies. As a teacher he was forcible, distinct, and quiet, and the practical value of his advice was aided by care in suiting his instruction to his audiences. As a colleague I can speak of him as always reasonable, consistent, and loyal. He earned the respect of all who worked with him."

Battle at the time of his death was consulting surgeon at the Royal Free Hospital, and Mr. Willmott Evans, who for many years was his colleague at that institution, describes the many opportunities he had of seeing Battle at work. He writes as follows: "As a surgeon Battle was an expert operator, rapid where the facts showed the need for action, but in all doubtful cases very careful. He was a scrupulous diagnostician so that the information obtained at the operation usually coincided exactly with his first opinion, although he never had any hesitation in modifying his diagnosis as further information or circumstances warranted. His teaching at the medical school associated with the Royal Free Hospital was much valued, especially by the senior students who could appreciate the caution with which he balanced his data, although he showed his care in the instruction of more junior students by his readiness to clear up any point in his lectures or demonstrations which presented difficulty to them. He always took particular pains to point out to students which were the things that seemed to him of the most importance when coming to conclusions, so that he effectively made clear the basis on which his teaching was formed and the circumstances which should dictate diagnosis."

Battle's interest in the diagnosis to be made and the procedure to be followed in abdominal surgery continued through his life. As far back as 1910 he delivered the annual oration to the Medical Society of London upon intraperitoneal injuries, and in that discourse gave a lucid description of where particular attention should be paid in ascertaining the exact lesion present. And only three years ago, after considerable retirement from St. Thomas's Hospital, he wrote in these columns a valuable letter upon the occurrence of appendicitis, considering that obvious evidence existed for a thorough scrutiny into the increasing incidence of the disease.

Mr. Battle retired from the position of surgeon at St. Thomas's Hospital in 1925 with the rank of consultant, leaving behind him the reputation of a devoted hospital servant as well as a great surgeon and teacher.

Sir Cuthbert Wallace writes: "Every surgeon has attributes by which he is remembered by those that he taught. In thinking of Battle the one thing that stands out in my memory was his devotion to his duty as shown by his regularity of attendance on his hospital days. Nothing interfered with his hospital work and a student was sure to find him in his ward at the appointed time, and was equally sure of having a profitable afternoon. His teaching was simple, clear, direct, and seemed to supply just what the student wanted. This resulted in his having a large following in the wards whenever he appeared. He had a wide knowledge of the literature of his subjects and no doubt his constant writing for the journals crystallised useful data in his mind and enabled him to distinguish facts from theories, much to the advantage of those he taught. As a surgeon he may be described as sure and safe rather than brilliant, and as an operator he was neat, quiet, and without fuss. Many men still practising must have grateful thoughts for Battle."

Mr. Battle married in 1892 Anna Marguerite Vulliamy by whom he had three sons and two daughters. One son was killed in the war, and of

the survivors one is squadron-leader in the R.A.F. and the other is Mr. Richard Battle, who follows in his father's footsteps as surgical registrar at St. Thomas's Hospital.

FARQUHAR MACRAE, M.B. Glasg.

WE regret to announce the death of Mr. Farquhar Macrae which occurred on Feb. 2nd at Newmill, St. Andrews, where he had retired in 1929 after a long period of surgical practice in Glasgow and the West of Scotland.

Farquhar Macrae graduated M.B., C.M., with commendation at Glasgow University in 1895, after which he acted as house surgeon and house physician at the Glasgow Western Infirmary and Royal Hospital for Sick Children. At the termination of these appointments he studied under Prof. W. D. Halliburton at King's College, London, for some time, and thereafter became assistant to Sir Arthur Mayo Robson in Leeds. It was during this time that he gained that insight into gall-bladder surgery which stood him in great stead in later life. After a few years in Leeds, he returned to Glasgow and was appointed surgeon to the out-patient department at the Western Infirmary, where he was associated with Sir Hector Cameron and Sir Kennedy Dalziel, both in hospital and private practice. Later he was appointed to the post of assistant surgeon to the Victoria Infirmary, surgeon to the City of Glasgow Fever Hospitals, and consultant surgeon to Ayr County Hospital. He returned to the Western Infirmary in 1922 as visiting surgeon and was appointed a lecturer in surgery to the university. On various occasions he acted as examiner in surgery both at Glasgow and Edinburgh Universities, and was a fellow of the Association of Surgeons of Great Britain and Ireland.

MR. MACRAE
[Photograph by Annan

On his retirement in 1929 he bought a house at St. Andrews, but shortly afterwards he was invited by the General Medical Council to undertake the duties of inspector of examinations. These occupied the best part of three years, and at their termination he forwarded to the G.M.C. a report which was at once recognised as being of the greatest importance. His excellent work here led in 1933 to his being asked by the India Office to undertake the post of secretary-inspector to the newly formed Indian Medical Council and he proceeded to India, remaining there for more than a year. He found the work one of great delicacy for an official not possessing special knowledge of India and Indian educational standards, but he did valuable work in preparing the ground.

Macrae never wrote much, but he was ever a keen student of the literature of his subject and was possessed of the rare faculty of being able to sift the grain from the chaff. Among his publications are the following: Editor, "Diseases of the Gall-bladder and Bile-ducts," second edition, 1900; joint author, Affections of the Gall-bladder and Bile-ducts, Encyc. Med.; Diagnosis of Peritonitis occurring during Enteric Fever; Cholelithiasis, Diagnosis, and Treatment, *Brit. Med. Jour.*, 1922; Diagnosis in Abdominal Diseases, Finlayson's "Manual of Clinical Medicine," 1927.

He was a man much loved by all who knew him well. With tall stature and strong countenance, he inspired great confidence in his patients and friends, while his wide experience and sound knowledge were always available to those who sought his help. As a clinician he was outstanding, so that he attracted large numbers of students to his clinics. His teaching was inspiring, based on a wide knowledge of pathology and literature in general. He was sometimes of short temper and could then employ a cutting tongue, but his actions were never petty, and he was a particularly sound judge of men, and was often consulted regarding appointments.

Farquhar Macrae built up a large surgical practice and when he retired in 1929 his loss both as surgeon and man was felt to be great. He leaves a widow to whom we extend our deepest sympathy.

A colleague of Farquhar Macrae writes: "The death of Mr. Farquhar Macrae is a great loss to the medical profession and to his many friends. His career has been outlined above and his surgical influence on the Glasgow school appreciated, but it is the influence and personality of the man which I would emphasise. Macrae had not many degrees, nor did he publish frequently. He did not seek publicity, and believed in inherent ability and honesty of purpose. Outstandingly he was a man. A tall, handsome figure, somewhat severe in expression, he inspired great confidence in all who met him; and more than confidence, for sympathy where deserved was one of his great attributes. Children loved him, and with them he was at his best. His simplicity of heart, ready understanding, and directness of purpose without excuse or explanation endeared him to them, and children are seldom wrong. The personality, the poise, the honesty of Macrae are seldom found in one human being, and with those he combined wealth of clinical acumen—that clinical sense which is of more value than much book learning; yet he had an intimate knowledge of all recent advances and a keen critical faculty as to their value.

"After his retiral in 1929 he acted as inspector of examinations for the G.M.C. and for the Dental Council. His reports on these matters were so excellent that he was appointed to an extremely responsible post as secretary to the Medical Council for India. The strain and difficulties of this and the climate of India had their effect on his health and he was unable to continue and returned to St. Andrews after fourteen months' service to carry on his interest in the furtherance of medical problems and study, his work in India having laid a sound foundation for a successor. Unfortunately his illness proved more serious than was supposed and he had not many months left of active life. His funeral was attended by many friends, and his great relaxation of golf was made noticeable by the fact that a number of St. Andrews' caddies attended the graveside. They, like his medical and lay friends, appreciated the greatness of the man, great of stature, great of mind; they understood his personality, his humour,

and his lovableness. We who knew him mourn him deeply and doubt if his like will pass this way again in our time."

ARTHUR JOHN SCOTT PINCHIN, M.D., F.R.C.P. Lond.

Dr. A. J. Scott Pinchin died at his home in Gledhow-gardens on Feb. 7th. He was in his sixtieth year and had been ill with pneumonia for only three days. Born at Sutton, Surrey, in 1877, the son of Alfred James Pinchin, oil broker, he was educated at Dulwich College and St. Thomas's Hospital from which he graduated in 1906, taking the gold medal in medicine at the London M.D. examination three years later. After holding house appointments at St. Thomas's, first as house physician to T. D. Acland, then as resident anæsthetist and casualty officer, Dr. Pinchin settled for a year or two in general practice at Egham, Surrey, becoming an active member of the Windsor Medical Society and assistant school medical officer to the L.C.C. But he soon decided to devote himself to consulting work in diseases of the chest, and to this end he secured positions on the honorary staff of the Hampstead General Hospital, the West London Hospital, and the Victoria Park Chest Hospital, to two of which at the time of his death he was senior physician. He also took charge of the tuberculosis dispensary at Hampstead and was consulted by the New End Poor-law Hospital at Hampstead and the Maidenhead Hospital.

DR. SCOTT PINCHIN

All this work, combined with a considerable private practice, kept him more than fully occupied for 25 years, only broken by a period during the war when he had charge of the officers' hospital at Imtarfa, Malta. Dr. Pinchin was an exceptionally good diagnostician and a sound practical physician, skilful in the use of instruments and quick to see their possibilities in modern medicine. He took charge of the electrocardiograph department when it was started at Victoria Park; after the war he was early in the field with the use of the thoracoscope, and with his junior colleague, Dr. H. V. Morlock, founded the bronchoscopic clinic at the same hospital. Despite indifferent health he was an indefatigable worker, devoted to the hospital side of his work, and popular with his house staff to whose assistance he was always ready to come in trouble. Almost his last act before he was taken ill was to attend a former resident in a rapidly fatal attack of pneumonia.

"Scott Pinchin," a colleague writes, "was a very lovable person and I doubt if he had an enemy in the world. He was a man of deep religious convictions, quiet and self-effacing. A shy and rather nervous manner made him avoid formal lecturing and public speaking as far as possible. He will be remembered by his colleagues for sterling worth and a gift of friendship."

He wrote a good deal at various times, mostly in medical journals, covering at first a wide range of intrathoracic subjects but later concentrating chiefly on chronic pulmonary suppuration. His last contribution to our columns in June, 1935, concluded a series of papers, written over many years with Dr. Morlock, dealing with abscesses of the lung. "From small collections of clinical impressions such as these," he quoted modestly, "it may become possible in time to obtain an individual experience which will bring to bear at the right moment all the weapons available for use in this distressing condition." But he was writing from an experience of 2000 bronchoscopies over a period of four years, which has added substantially to our knowledge and for which clinical medicine is in debt to his memory.

Dr. Scott Pinchin married Miss Margaret Johnson, daughter of David Johnson, a well-known inventor, who survives him. There were no children of the marriage.

JOHN HENRY WILLIAMS, L.S.A., M.P.

THE death is announced as occurring on Feb. 7th of Dr. John Henry Williams, Member of Parliament for the Llanelly division of Carmarthen. Dr. Williams, by birth a Liverpool man, received his medical education at the Cardiff Medical School and the London Hospital and was for a time medical officer in the Booth Line. When he eventually settled in Wales at Burry Port he became a prominent practitioner and energetic in public causes. He was chairman first of the Burry Port district council and later of the Carmarthenshire county council and took a leading part in the promotion of the general health of the county and also in child welfare work. A Socialist in politics he had represented Llanelly in the House of Commons for more than 12 years, a proof of considerable determination on his side, for he was not successful until his fourth attempt in 1922; but having obtained admission to the House he stood the brunt of future contests and at the general election of November last was returned unopposed. From this short record it will be clear that in Dr. Williams his community has lost a valuable servant.

DR. WILLIAMS

WILLIAM HENRY RUSSELL FORSBROOK, M.D. Lond.

THE death was announced in our columns last week of Dr. William Forsbrook, a well-known practitioner in the Eaton-square district. A prominent student at the Westminster Medical School where he was Chadwick prizeman and Bird medallist, he took the diplomas of L.S.A. and M.R.C.S. Eng. and graduated with honours as M.B. Lond. in 1878, later proceeding to the M.D. degree. Before going into

private practice he held the resident posts at the Westminster Hospital and was also surgical registrar. He was a frequent adviser to medical men proposing to practise in South Africa. He died on Feb. 3rd aged 85.

THE LATE SIR JOHN MARNOCH

Emeritus Professor J. A. MACWILLIAM, F.R.S., sends the following personal appreciation of Sir John Marnoch of whom an obituary notice appeared last week :—

"Far and wide the news of Sir John Marnoch's death will reach, and everywhere touch responsive chords of deep sympathy and awaken many memories. My own mind goes back to the time, more than forty years ago, when I was so fortunate as to have his able assistance in the work of the physiology department at Aberdeen after his brilliant student career. It is grievous to think now that his fine record has come to the end. Until he was suddenly stricken by illness some three years ago he looked very young for his age ; whether seen at his work or in his ideally happy hospitable home, his slender alert figure and his keen vitality and notable zest in life gave every promise of many active years still to come. The decline of his physical strength in recent time he accepted in the fine impersonal spirit characteristic of the man. Superb operator as he was, quiet, quick, and infinitely dexterous, what was still rarer was a supreme gift of wise and balanced judgment in dealing in comprehensive and far-sighted fashion with the various considerations of complex and difficult problems. His clarity of thought was remarkable. When an involved subject had been dealt with by Marnoch it came out shorn of all non-essentials, reduced to its simplest terms and expressed in a minimum of precise and lucid sentences.

"Marnoch was a gifted musician, his strikingly beautiful hands equally at home on the violin and with the scalpel. As a golfer and a salmon fisher on the reaches of his beloved Spey he was keen and skilful—an artist in all that he touched, whether work or recreation. His great success never changed John Marnoch in the least ; his simplicity, absolute sincerity, and innate modesty were conspicuous in him while life lasted. Endlessly willing and most generously helpful, with a gift of leal-hearted friendship, his memory will ever be cherished by all who knew him and had to do with him as colleagues, students, patients, or friends."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Advertisement of Medicines and Surgical Appliances

IN the ballot of private Members of the House of Commons for the right to present Bills which will come up for second reading on Fridays between now and Easter which took place on Feb. 6th Mr. G. A. V. DUCKWORTH (Shrewsbury, Unionist) was one of the first eight names in the ballot. The Bill which he proposes to bring forward is entitled the Medicines and Surgical Appliances (Advertisement) Bill. The measure is the outcome of the work of a committee representative of the various interests connected with the trade in proprietary medicines, and aims at the removal of some of the worst abuses in the advertising of those articles. Among the deputation which presented the Bill to the Minister of Health were representatives of local authorities, the British Medical Association, the Society of Medical Officers of Health, the Parliamentary Medical Committee, the Parliamentary Committee on Food and Health, newspaper and advertising associations, the Pharmaceutical Society of Great Britain, and bodies representing the drug trade, manufacturers of surgical instruments, and the Proprietary Association of Great Britain. The prohibitions in the Bill extend only to certain types of advertising. No one is prohibited by the Bill from treating any ailment or from supplying any medicine or appliance. Certain ailments and conditions are specified, and restrictions are imposed upon certain methods of "holding out" medicines, appliances, or treatment as beneficial to those suffering from them. The Minister of Health may remove any of the specified ailments or conditions from the operation of the Act, but he may not add new ones.

THE OFFENCE OF "HOLDING OUT"

According to an explanatory memorandum drawn up by the promoters of the Bill it is proposed to make it illegal in connexion with the supply or offer of a medicine or appliance or treatment to hold it out as effective for the cure or for the prevention or for exercising any salutary influence on any of the following ailments :—

(*a*) Bright's disease, cancer, consumption, diabetes, epilepsy, fits, locomotor ataxy, lupus, or paralysis.

It would also be illegal in connexion with the supply or offer of a medicine or appliance or treatment to hold it out as effective for any of the following purposes :—

(*b*) The cure of amenorrhœa, hernia, blindness, any structural or organic ailment of the auditory system, habits associated with sexual excess or indulgence, and any ailment associated with those habits ; (*c*) procuring miscarriage of women ; (*d*) the promotion of sexual virility in men or of sexual desire in women.

It would be illegal for the proprietor or distributor of a medicine or appliance and for a person administering treatment to publish a document which to his knowledge contains an intimation that any person is prepared to treat by correspondence any of the ailments or conditions mentioned under (*a*), (*b*), (*c*), and (*d*). The ailments referred to are those for which the Select Committee on Patent Medicines in 1914 recommended that advertisements for *cure* should be prohibited. In the Bill, the prohibition is extended to advertisements claiming effectiveness for *prevention* and for *exercising a salutary influence on the course* of those mentioned under (*a*).

EXCEPTIONS TO THIS OFFENCE

A "holding out" which would otherwise be illegal would be permitted in the following circumstances :—

(*a*) By a duly qualified medical practitioner or a registered dentist in the exercise of his profession ; (*b*) if it is directed to doctors, dentists, nurses, pharmacists, hospitals, and persons carrying on a business including the practice of medicine or dentistry, or the supply of medicines or appliances ; (*c*) in technical publications ; (*d*) in connexion with patent applications ; (*e*) to a patient for whom the medicine, appliance, or treatment has been prescribed by a doctor or dentist.

Certain advertisements for articles of diet which would otherwise be illegal are proposed to be permitted. But the claim made must be no more than that, as an article of diet and not otherwise, the article is effective for the preventing or exercising a salutary influence on (but not curing) any of the ailments mentioned under (*a*).

A person who publishes or delivers any document which the Act makes illegal commits an offence unless he can show that he delivered it in a package containing a medicine or appliance in the form in which it was supplied to him.

DIAGNOSIS OR TREATMENT BY CORRESPONDENCE

Invitations to correspond with a view to diagnosis or treatment may not be issued by the proprietor or distributor of a medicine or appliance or a person who administers treatment. It is illegal for such a person to publish any document which to his knowledge intimates that any person is prepared to diagnose by correspondence or to receive a statement of symptoms of ill-health with a view to advising for treatment by correspondence.

It is, however, permissible to advertise that a person will receive from someone who *states that he knows himself to be suffering* from a particular ailment particulars with a view to the supply of some article for its treatment. No such advertisement may refer to any of the ailments included under (*a*) or to amenorrhœa or to blindness. It is to be noted—

(1) That the offence is the publication of a document; (2) that the intimation must be for *treatment by correspondence;* (3) that the ailments and conditions to which the prohibition applies are limited.

No prosecution can be instituted without the consent of the Attorney-General.

SAVING CLAUSES

There is a saving clause for proprietors, publishers, printers, and distributors of newspapers and periodicals; for printers and distributors of circulars and other documents; for advertising agents; and for the employees of any of them. None of them is liable to be convicted of an offence under the Act if in the ordinary course of his particular business he has taken part in the publication of an advertisement which is illegal under the Act.

There is a further saving clause for a person professing a religious belief in the effectiveness of some means other than medicines or appliances for curing or preventing or exercising a salutary influence upon any of the ailments included under (*a*) or for curing any of the habits included under (*b*) in para. 2 of this memorandum. He may hold out the means as being effective for that purpose or he may publish an intimation that someone is prepared to employ that means for that purpose by correspondence. But to avail himself of this defence he must show to the satisfaction of the court that he is acting in accordance with the principles and practice of a religious body comprising a substantial number of persons resident in the United Kingdom who profess that belief, and also that he is authorised in accordance with the constitution of that body to act in that way. This exemption is to cover such treatment as "faith-healing" or prayer. To prevent the rogue taking shelter under it, it is limited to members of organised religious bodies, as, for example, Christian Scientists and Spiritualists.

In the House of Commons on Friday, Feb. 7th, Mr. DUCKWORTH presented the Medicines and Surgical Appliances (Advertisement) Bill which was set down for second reading on March 27th.

In the House of Lords on Thursday, Feb. 6th, the Royal National Pension Fund for Nurses Bill was presented and read a first time.

On Monday, Feb. 10th, in the House of Commons, Mr. TINKER presented the Public Health (Coal Mines Refuse) Bill, the object of which is to amend the Public Health Act, 1875, with respect to coal mine refuse liable to spontaneous combustion.

In the House of Lords on Tuesday, Feb. 11th, the report of Amendments to the Voluntary Hospitals (Paying Patients) Bill was agreed to on the motion of Lord Luke.

HOUSE OF COMMONS

WEDNESDAY, FEB. 5TH

Departmental Inquiry into Workmen's Compensation

Mr. TOM SMITH asked the Home Secretary what progress was being made by the departmental committee inquiring into certain matters connected with the Workmen's Compensation Act.—Mr. GEOFFREY LLOYD, Under-Secretary of State for the Home Department, replied: I understand that the committee have had several meetings and taken a substantial amount of evidence. A good deal more, however, remains to be heard, and it is not possible at present to forecast when the inquiry is likely to be completed.—Mr. BURKE: Will the hon. gentleman take into consideration the very great difficulty that workmen suffering from silicosis have in making a claim under the Compensation Act?—Mr. LLOYD: That is a matter for the committee.

THURSDAY, FEB. 6TH

Protection of Life from Fire

Mr. GRAHAM WHITE asked the Minister of Health (1) if his attention had been drawn to the loss of life due to recent outbreaks of fire in Edinburgh and Tyldesley; and whether, in view of the fact that in these and other cases escape from burning buildings had been prevented by the destruction of staircases, he would in future, where possible, prescribe and elsewhere recommend that staircases should be constructed from fireproof material; and (2) if it was his intention to introduce legislation for the better inspection of buildings, with a view to reducing the risk of life and damage from fire to a minimum.—Sir K. WOOD replied: My attention has been called to the outbreaks of fire referred to. I have no power to prescribe the method of constructing staircases, but local authorities can deal with the matter by by-laws and have various powers of inspecting buildings. I will consider whether it is desirable to issue any recommendation to local authorities.

Grants for Water-supply

Mr. WELLS asked the Minister of Health (1) the number of applications received in respect of water-supplies and the total amount of grants up to the end of January last, and also the number of grants that had been given for areas where the rates, previous to a proposed scheme, had been under 10*s.* in the £; and (2) the total number of cases in which applications for grants in respect of water-supplies had been refused.—Sir K. WOOD replied: Up to the end of January last applications had been received in respect of 876 schemes relating to 2227 parishes. Grants totalling £831,000 had been provisionally allocated in respect of 550 schemes for 1707 parishes, including 182 schemes where, previous to the proposed scheme, the rates were less than 10*s.* in the £. Grants had been refused in respect of 190 schemes on the ground that they were not needed to enable the schemes to be carried out.

Nutrition Surveys

Mr. JOEL asked the President of the Board of Education whether, in view of his departmental circular on free meals and free milk for underfed school-children, he could state whether any education authorities were acting on his advice to hold periodically nutrition surveys at which all children not receiving free meals would be passed under review; and whether he could give the names of such authorities.—Mr. OLIVER STANLEY replied: I understand that certain local education authorities have acted, or propose to act, on the Board's suggestions that periodical nutrition surveys should be held at which children not receiving meals would be passed under review. I am afraid however that I have no information about the number of these authorities, but I understand that the areas in which complete or partial surveys have been or will be held include Swansea, Gateshead, Norwich, Liverpool, and Workington.

Spa Treatment for Health Insurance Patients

Mr. MANDER asked the Minister of Health if he would consider the desirability of arranging that spa treatment should be an additional benefit under national health insurance.—Sir K. WOOD replied: The present list of additional benefits affords to approved societies a wide variety of forms of remedial treatment, and in fact the surplus funds of societies available as a result of the last valuation have already been allocated on this basis. The addition of spa treatment was considered but was not selected. If before the date of the next valuation I have evidence that there is a fairly widespread desire

on the part of societies for the suggested addition, I will give the matter further consideration. Mr. MANDER: Has not the right hon. gentleman recently had a good many representations from societies on this subject? Sir K. WOOD: Yes, Sir, that is so.

Typhoid Fever in Derbyshire

Mr. HOLLAND asked the Minister of Health if he was aware that an outbreak of typhoid fever was affecting a number of persons residing in the village of Langwith, Derbyshire, in the area controlled by the Blackwell rural district council; and what steps had been taken to deal with the matter.—Sir K. WOOD replied: The answer to the first part of the question is in the affirmative. As regards the second part, on the recommendation of my department the previous source of the water-supply to this village has now been abandoned in favour of one which, it is believed, is free from pollution, and I hope that there will be no recurrence of the outbreak.

Mr. HOLLAND asked the Minister of Health if his attention had been drawn to the frequent floodings from a canal on one side and a polluted river on the other of houses situate in Meadow Rams, Pinxton, Derbyshire, endangering the health of the inhabitants and giving rise to great inconvenience; and was he satisfied that proper progress was being made by the Blackwell rural district council in dealing with the matter.—Sir K. WOOD replied: My attention has not previously been drawn to this matter. I will make inquiries.

Mental Treatment

Mrs. TATE asked the Minister of Health what was the increase, if any, in proportion to the population, in the number of persons receiving mental treatment in private homes and State and voluntary hospitals, in the years 1900, 1920, 1930, and 1935 respectively; and whether there was in every case sufficient accommodation for those requiring treatment.—Sir K. WOOD replied: The number of persons per 10,000 of population receiving mental treatment in the places indicated was 25·4 in 1900; 26·3 in 1920; 31·3 in 1930; and 32·8 in 1935. The answer to the second part of the question is in the affirmative, except that in 1930 and 1935 the number of beds available in some public mental hospitals was not sufficient to enable the prescribed standards of bed space to be fully observed. Local authorities in the areas concerned are now actively engaged in providing additional accommodation where needed.

Workmen's Compensation: Medical and Legal Expenses

Mr. T. SMITH asked the Home Secretary whether he would arrange that in future annual statistics on workmen's compensation, legal and medical expenses should be shown as separate items.—Mr. G. LLOYD replied: The returns under the Workmen's Compensation Act on which the annual Home Office statistics are based cover only the compensation paid, and I am afraid that there would be great difficulties in the way of obtaining the amount of the legal and medical expenses incurred by the various parties concerned. So far as regards insurance companies I understand that for the group belonging to the Accidents Offices Association, which includes most of the larger companies, legal expenses are estimated at 2½ per cent. and medical expenses at 1¾ per cent. of the premium income.

MONDAY, FEB. 10TH

Bombing of Red Cross Units in Abyssinia

Mr. WATKINS asked the Secretary of State for Foreign Affairs whether he had any information on how many occasions since the outbreak of hostilities Italian aircraft had bombed Red Cross units in Abyssinia; and whether any British Red Cross units or British subjects serving with Red Cross units had been attacked in this way.—Mr. EDEN replied: According to such information as is available, I understand that the American hospital at Dessie was bombed on Dec. 6th last. On Dec. 30th the Swedish ambulance operating with the Ethiopian forces on the southern front was virtually destroyed by aircraft near Dolo, and on Jan. 4th Ethiopian Red Cross Ambulance No. 1, whose staff includes two British subjects, was bombed and machine-gunned near Dagabur. The one wholly British ambulance now serving in Ethiopia has not suffered as the result of Italian air action.

Dialling of Emergency Telephone Calls

Mr. DAY asked the Postmaster-General whether, in view of the delay caused at times when dialling O on the automatic telephone exchange in the case of an emergency, he would consider with his engineers whether another dialling signal could be substituted on all automatic exchanges direct to fire, police, and ambulance stations; and if he could say how long it would take to make this alteration in the present telephone equipment, and what would be the estimated cost.—Major TRYON replied: I recently appointed a committee to consider the best means of securing the rapid setting up of emergency telephone calls; and I am afraid it would be difficult to frame estimates such as the hon. Member asks for before receiving their recommendations.

Milk Designations Draft Order

Mr. THOMAS WILLIAMS asked the Minister of Health how many protests had been received by his department concerning the revised draft order, special designations for milk; whether he was aware of the general opposition of all producers of Certified milk and all those agencies who were trying to improve the standard and qua[l]ity of milk; and if he would consult with interested [p]arties before the revised draft order came into for[ce].—Mr. SHAKESPEARE, Parliamentary Secretary to the [Ministry] of Health, replied: My right hon. friend has received very few representations with regard to the r[evised] Milk (Special Designations) Order which w[as] on Jan. 24th. The answer to the second part of the question is in the negative. It is open to all interested parties to make representations to my right hon. friend upon the draft within 40 days of its publication, and such representations will receive full consider[ation].

Duties of Nurses in Mental Hospit[als]

Sir FRANCIS FREMANTLE asked the Minister of Health what were the orders or regulations governing the hours and facilities for nurses in mental hospitals; whether he would inquire into their adequacy, considering the special need in such occupation of daily and weekly change of environment.—Sir K. WOOD replied: The hours of duty and conditions of service for nurses in mental hospitals are determined by the visiting committees of those institutions. The majority have adopted the scheme recommended by the joint conciliation committee representing employers and nurses. An increasing number of local authorities are providing change of environment and recreational facilities by establishing nurses' homes for mental hospital staffs. I am not aware of circumstances indicating the necessity for an inquiry, but if my hon. friend has particular cases in mind, perhaps he will communicate with me.

Resident Chaplains in Mental Institutions

Sir FRANCIS FREMANTLE asked the Minister of Health whether, in view of the value of intelligent and sympathetic ministers of religion in the treatment of mental disease and deficiency, he would take steps to promote the appointment in mental institutions of resident chaplains suited and qualified for the work.—Sir K. WOOD replied: The appointment of whole-time or resident chaplains is within the discretion of the authorities owning mental institutions. The importance of such appointments in large mental hospitals was emphasised in the report of the Board of Control issued last year, and the matter will be brought to the notice of individual authorities as opportunity occurs. I am not, however, empowered to give any direction in the matter.

Milk Act, 1934, to Remain in Force

Sir EDWARD RUGGLES-BRISE asked the Minister of Agriculture what action the Government proposed to take when the main provisions of the Milk Act, 1934, expired at the end of March.—Mr. ELLIOT replied: For several reasons, including the currency of various trade agreements and the fact that the report of the Reorganisation Commission for Milk for Great Britain is not likely to be published for some time to come, it is not possible at present to bring before Parliament long-term legislation for the milk industry. In order to allow adequate time

for the consideration by all parties of the important questions at issue, the Government have decided to ask Parliament to continue until the end of September, 1937, the main provisions of the Milk Act, 1934. A Bill to give effect to this decision will be introduced forthwith.

TUESDAY, FEB. 11TH

Loss of Dangerous Drugs and Poisons

Sir JOSEPH LAMB asked the Home Secretary whether his attention had been called to the increasing number of cases where dangerous drugs and poisons had been lost in transit or stolen from unattended vehicles and to the danger caused thereby to the general public; and what action, if any, he proposed to take in the matter. —Sir J. SIMON replied: There is, I think, no reason to suppose that there has been any increase in the number of such cases, though they have had more publicity of late by reason in particular of the fact that broadcasting is now employed when a loss or theft of this kind is reported to the police and it is thought necessary that the public should be warned by this means. The remedy seems to lie in the exercise of more care and good sense by those concerned, and I hope that the wider publicity will help to achieve that result.

[redacted]SEPH LAMB asked whether, if that did not bring desired result, the Home Secretary would re stringent regulations to prevent these

[redacted]ON said the hon. Member would see that danger, if they were not careful, of [redacted]s from reporting such losses for fear of to themselves. It was much better report the loss quickly, then the police

[redacted]ttendance of Arrested Persons

[redacted]sked the Home Secretary what were the [redacted]erning medical attendance on persons detained under arrest at police stations pending appearance before the magistrates; and if he would say whether such arrested persons had the right to see a doctor on request.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: All police forces have instructions to take special care in regard to the treatment of prisoners suffering from illness, to call a doctor to examine any prisoner who complains of illness or shows symptoms of being in a feeble state of health, and to have him removed to hospital if the doctor thinks it necessary. If such a person wished to call in a doctor selected by himself, steps would be taken to meet his wishes if possible, but the police would not wait for a request or complaint from him if they considered that he needed medical attention.

Variola Minor

Mr. BROMFIELD asked the Minister of Health whether he would consider the advisability of making a special investigation of the circumstances attending the outbreak of variola minor which prevailed in certain limited areas of this country during the years 1922–34, with a view to ascertaining what were the causes of its greater incidence in mining areas and whether the disease affected mainly those areas where infant vaccination had declined most. —Sir K. WOOD replied: During the years referred to in the question small-pox occurred in no less than 49 of the 61 counties in England and Wales. The circumstances in which the disease occurred were described in the annual reports of the chief medical officer of my department, and also in a review published in 1931 entitled "A Review of Certain Present Aspects of Small-pox Prevention in relation particularly to the Vaccination Act, 1867 to 1907." The published reports contain full statistics as to the numbers of vaccinated and unvaccinated children, respectively, who contracted the disease, and they afford ample evidence of the value of vaccination as a preventive of the disease. In these circumstances I do not think that any special investigation is necessary.

MEDICAL NEWS

[redacted]niversity of Cambridge

The degree of bachelor of medicine has been conferred on W. A. Law and the degree of bachelor of surgery on K. G. F. Mackenzie.

University of London

Four lectures on the endocrine organs in relation to metabolism will be given by Dr. C. Reid on Mondays, March 2nd, 9th, 16th, and 23rd, at University College, Gower-street, W.C., at 5 P.M. The lectures are open to all.

University of Glasgow

On Wednesdays, Fridays, and Mondays from April 15th, in the ophthalmic department of the University, Prof. Arthur Brückner, of Basle, is giving six lectures on physiological optics and their relation to clinical ophthalmology and special clinical ophthalmological problems.

Royal College of Physicians of Edinburgh

A quarterly meeting of the college was held on Feb. 4th with Dr. W. T. Ritchie, the president, in the chair, when Dr. John Philip Cameron (Edinburgh) was introduced and took his seat as a fellow, and Dr. Prag Nath Kapur (Delhi) and Dr. Venkatasubha Mahadevan (Madras) were elected to the fellowship.

Dr. J. G. Greenfield was appointed the Morison lecturer for 1936, Sir Thomas Lewis the George Alexander Gibson lecturer for 1936, and Dr. J. D. Gilruth the Dr. Alexander Black lecturer for 1936.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Feb. 3rd, with Prof. Archibald Young, the president, in the chair, Dr. Sailes Chandra Guha, of Rangoon, was admitted to the fellowship.

Royal Microscopical Society

At a meeting of this society at B.M.A. House, Tavistock-square, London, W.C., at 5.30 P.M. on Wednesday, Feb. 19th, Dr. G. M. Findlay will read a paper on a new virus disease of mice.

Grants for Scientific Investigations

Particulars of government grants for scientific investigations may be obtained from the clerk to the government grant committee of the Royal Society, Burlington House, London, W.1, and applications should be sent to him not later than March 31st.

Lectures in Hospital Administration

A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given by Dr. J. V. Armstrong at the Brook Hospital, Shooters Hill, Woolwich, S.E., on Mondays, Wednesdays, and alternate Saturdays, beginning on Wednesday, April 1st. Further particulars may be had from the medical officer of health of the London County Council, Public Health Department (Special Hospitals), County Hall, S.E.1.

The Cost of Superstition

The serpent, emblem of the healing art, twined round a staff on the tower of East Grinstead's new hospital is probably to be removed, because it is thought to have brought bad luck to the hospital. The institution was opened less than a month ago and, according to a correspondent in the *Times*, two patients have already died in hospital, the matron has been ill, and it is now recalled that the rain fell in torrents on the day of the opening. It will cost £60 to remove the serpent.

Tuberculosis Conference

The twenty-second annual conference of the National Association for the Prevention of Tuberculosis will be held at the County Hall, London, from July 16th to 18th, under the presidency of Sir Robert Philip, chairman of the council of the association. Subjects for discussion will include: examination of contacts; protection of the adolescent and young adult from tuberculosis; tubercle-free herds; and the need for closer coöperation between the tuberculosis service and the maternity and child welfare service, and possibly the educational authorities. The secretary may be addressed at Tavistock House North, Tavistock-square, London, W.C.1.

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Sir JOSEPH LAMB asked whether, if that did not bring about the desired result, the Home Secretary would bring in more stringent regulations to prevent these happenings.

Sir JOHN SIMON said the hon. Member would see that there would be danger, if they were not careful, of restraining persons from reporting such losses for fear of the consequences to themselves. It was much better that they should report the loss quickly, then the police could be helpful.

Medical Attendance of Arrested Persons

Mr. JAGGER asked the Home Secretary what were the regulations governing medical attendance on persons detained under arrest at police stations pending appearance before the magistrates; and if he would say whether such arrested persons had the right to see a doctor on request.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: All police forces have instructions to take special care in regard to the treatment of prisoners suffering from illness, to call a doctor to examine any prisoner who complains of illness or shows symptoms of being in a feeble state of health, and to have him removed to hospital if the doctor thinks it necessary. If such a person wished to call in a doctor selected by himself, steps would be taken to meet his wishes if possible, but the police would not wait for a request or complaint from him if they considered that he needed medical attention.

Variola Minor

Mr. BROMFIELD asked the Minister of Health whether he would consider the advisability of making a special investigation of the circumstances attending the outbreak of variola minor which prevailed in certain limited areas of this country during the years 1922–34, with a view to ascertaining what were the causes of its greater incidence in mining areas and whether the disease affected mainly those areas where infant vaccination had declined most. —Sir K. WOOD replied: During the years referred to in the question small-pox occurred in no less than 49 of the 61 counties in England and Wales. The circumstances in which the disease occurred were described in the annual reports of the chief medical officer of my department, and also in a review published in 1931 entitled "A Review of Certain Present Aspects of Small-pox Prevention in relation particularly to the Vaccination Act, 1867 to 1907." The published reports contain full statistics as to the numbers of vaccinated and unvaccinated children, respectively, who contracted the disease, and they afford ample evidence of the value of vaccination as a preventive of the disease. In these circumstances I do not think that any special investigation is necessary.

MEDICAL NEWS

University of Cambridge

The degree of bachelor of medicine has been conferred on W. A. Law and the degree of bachelor of surgery on K. G. F. Mackenzie.

University of London

Four lectures on the endocrine organs in relation to metabolism will be given by Dr. C. Reid on Mondays, March 2nd, 9th, 16th, and 23rd, at University College, Gower-street, W.C., at 5 P.M. The lectures are open to all.

University of Glasgow

On Wednesdays, Fridays, and Mondays from April 15th, in the ophthalmic department of the University, Prof. Arthur Brückner, of Basle, is giving six lectures on physiological optics and their relation to clinical ophthalmology and special clinical ophthalmological problems.

Royal College of Physicians of Edinburgh

A quarterly meeting of the college was held on Feb. 4th with Dr. W. T. Ritchie, the president, in the chair, when Dr. John Philip Cameron (Edinburgh) was introduced and took his seat as a fellow, and Dr. Prag Nath Kapur (Delhi) and Dr. Venkatasubha Mahadevan (Madras) were elected to the fellowship.

Dr. J. G. Greenfield was appointed the Morison lecturer for 1936, Sir Thomas Lewis the George Alexander Gibson lecturer for 1936, and Dr. J. D. Gilruth the Dr. Alexander Black lecturer for 1936.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Feb. 3rd, with Prof. Archibald Young, the president, in the chair, Dr. Sailes Chandra Guha, of Rangoon, was admitted to the fellowship.

Royal Microscopical Society

At a meeting of this society at B.M.A. House, Tavistock-square, London, W.C., at 5.30 P.M. on Wednesday, Feb. 19th, Dr. G. M. Findlay will read a paper on a new virus disease of mice.

Grants for Scientific Investigations

Particulars of government grants for scientific investigations may be obtained from the clerk to the government grant committee of the Royal Society, Burlington House, London, W.1, and applications should be sent to him not later than March 31st.

Lectures in Hospital Administration

A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given by Dr. J. V. Armstrong at the Brook Hospital, Shooters Hill, Woolwich, S.E., on Mondays, Wednesdays, and alternate Saturdays, beginning on Wednesday, April 1st. Further particulars may be had from the medical officer of health of the London County Council, Public Health Department (Special Hospitals), County Hall, S.E.1.

The Cost of Superstition

The serpent, emblem of the healing art, twined round a staff on the tower of East Grinstead's new hospital is probably to be removed, because it is thought to have brought bad luck to the hospital. The institution was opened less than a month ago and, according to a correspondent in the *Times*, two patients have already died in hospital, the matron has been ill, and it is now recalled that the rain fell in torrents on the day of the opening. It will cost £60 to remove the serpent.

Tuberculosis Conference

The twenty-second annual conference of the National Association for the Prevention of Tuberculosis will be held at the County Hall, London, from July 16th to 18th, under the presidency of Sir Robert Philip, chairman of the council of the association. Subjects for discussion will include: examination of contacts; protection of the adolescent and young adult from tuberculosis; tubercle-free herds; and the need for closer coöperation between the tuberculosis service and the maternity and child welfare service, and possibly the educational authorities. The secretary may be addressed at Tavistock House North, Tavistock-square, London, W.C.1.

Sir Aldo Castellani has been appointed medical adviser to the King of Greece. He is at present on a tour of inspection of the Italian forces in Abyssinia.

Oldham Municipal Hospital

It is proposed to spend £30,000 on enlarging this hospital, as about 40 more beds are required in the general section.

New Health Clinic for Wellington

A new public health clinic has been opened by Lady Forester at Wellington. Part of the clinic will be used for tuberculosis cases and provision has been made for orthopædic after-care treatment.

Guild of Hospital Librarians

The second annual meeting of this association will be held from May 8th to 11th in La Salle Debussy, 8, Rue Daru, Paris, under the chairmanship of Dr. René Sand. Further information may be had from Mrs. M. E. Roberts, hon. secretary of the guild, 48, Queen's-gardens, London, W.2.

Poisons for Rodents

The University of London Animal Welfare Society is holding a discussion on this subject at the College of the Pharmaceutical Society, 17, Bloomsbury-square, London, W.C., at 5.30 P.M., on Thursday, Feb. 27th. The object of the discussion is to explore the feasibility of selecting and devising poisons with a view to humane considerations. Mr. J. G. Wright, F.R.C.V.S., will deal with the pathological effects of poisons, Mr. J. D. Hamer, F.I.C., will describe chemical rat-control in ships and docks, and Mr. T. Howard will speak on poisoned baits. The general discussion will be opened by Mr. G. D. Lander, D.Sc., and Prof. J. H. Burn, M.D., will be in the chair. Medical practitioners who wish to attend should inform the hon. secretary of the society, 42, Torrington-square, W.C.

Medical Congresses at Wiesbaden

The 27th meeting of the Deutsche Röntgen-Gesellschaft is to be held at Wiesbaden on March 26th, 27th, and 28th, under the presidency of Prof. Hans Dietlen. The first two days of the meeting will be devoted to diagnostic radiology and short-wave therapy, while on the last day physical and technical problems will be discussed. The 48th meeting of the Deutsche Gesellschaft für Innere Medizin is being held at Wiesbaden from March 23rd to 26th under the presidency of Prof. Schwenkenbecher, and on the 26th a joint meeting of the two societies will take place. Dr. Karl Frik, Brückenallee 22, Berlin, N.W. 87, is the secretary of the radiological congress.

Maternal Mortality and Abortion

On Feb. 11th Sir Kingsley Wood, the Minister of Health, received a deputation from the National Council of Women of Great Britain. Its object was to submit to the Minister a resolution urging (1) that the Government should appoint a representative committee to inquire into the incidence of abortion and as to the law and its administration dealing with criminal abortion and attempted abortion, and to consider what measures, if any, are advisable to improve the existing position; and (2) that future official returns should show the deaths attributable to abortion separately from the general figures for maternal mortality. The Minister said in his reply that the high rate of maternal mortality in certain districts had, for some time, been under investigation by medical officers of the Ministry, and before considering any further inquiry he would prefer to await their report, which he hoped to receive before the end of the year. He nevertheless promised that the deputation's statements would be examined to see if any action could usefully be taken in advance of the report. The problem was largely a social one, and he was determined to press on with the measures for slum clearance and abatement of overcrowding on which a good start had already been made. He would also continue to press local authorities to improve their maternity and child welfare services, and particularly to provide adequate antenatal care for pregnant women. A Bill to improve the midwifery service was about to be introduced.

Dr. George Leslie Milburn has been appointed an official member of the Legislative Council of the Presidency of St. Christopher and Nevis.

Society of Radiotherapists

This newly formed society will hold its first clinical meeting at the rooms of the Medical Society of London (11, Chandos-street, W.) on Friday, Feb. 21st, at 4.30 P.M. Mr. Geoffrey Keynes and Dr. W. M. Levitt will open a discussion on the technique of radiotherapy in carcinoma of the breast which has not been previousiy treated. The hon. secretary of the society is Dr. B. W. Windeyer, Middlesex Hospital, London, W.1.

Tribute to Medical Officer

At a recent meeting of the town council Dr. James Gairdner, who for 56 years has been medical officer for Crieff, received the congratulations of the burgh on attaining his 90th birthday. Dr. Gairdner has always taken a special interest in industrial diseases, and as long ago as 1895 described in his annual report valuable investigations into the composition of metallic fumes and the effects of manganese poisoning.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 18th.

Medicine. 5 P.M. Dr. Otto Leyton: The Morbid Conditions which Cause Progressive Hyperglycæmic Glycosuria and the Circumstances which Modify its Course. Dr. J. Graham Willmore, Dr. H. P. Himsworth, and Dr. T. C. Hunt will also speak.

General Meeting of Fellows. 5.30 P.M. Ballot for election to the Fellowship.

Pathology. 8.15 P.M. (London School of Hygiene, Keppel-street, W.C.) Sir Rickard Christophers: 1. Specimens illustrating *B. knowlesi* (the Parasite of Monkey Malaria). Dr. I. N. Asheshov: 2. Technical Methods Used in Investigation of the Bacteriophage. J. C. Cruickshank: 3. *Bact. typhiflavum*. H. Schwabacher: 4. Desensitisation of Tuberculin-sensitive Guinea-pigs. E. A. Straker: 5. Solubility of Pneumococci in Sodium Hydrate. G. S. Wilson: 6. Modified Methylene Blue Test for the Grading of Milk. 7. Rapid Method for the Quantitive Enumeration of *Bact. coli* and *Bact. ærogenes* in Water.

THURSDAY.

Dermatology. 5 P.M. (Cases at 4 P.M.) Dr H. W. Barber: 1. Keratosis Pilaris Atrophicans (previously shown). Dr. F. F. Hellier (for Dr. H. W. Barber): 2. Urticaria Pigmentosa. Dr. G. B. Dowling: 3. Schamberg's Disease. Dr. W. J. O'Donovan: 4. Lupus Erythematosus Treated by Radium. Dr. G. W. Bamber: 5. Fibroma with a Typical Epithelial Proliferation. Dr. Elizabeth Hunt: 6. Sebocystomatosis.

Neurology. 8.30 P.M. (Cases at 8 P.M.) Dr. T. Tennent: The Diagnosis and Treatment of Congenital General Paralysis. Dr. J. Brander, Dr. W. D. Nicol, and Dr. R. M. Stewart will also speak.

FRIDAY.

Obstetrics and Gynæcology. 8 P.M. Dame Louise McIlroy: Atresia of the Vagina Operation followed by Pregnancy and Cæsarean Section. Mr. A. A. Davis: Intrinsic Dysmenorrhœa. Mr. Malcolm Donaldson, Mr. V. B. Green-Armytage, Mr. Chassar Moir, Mr. B. P. Wiesner, Ph.D., and Prof. James Young will also speak.

Radiology. 8.15 P.M. Prof. H. Chaoul (Berlin): Some Recent Developments in X-ray Therapy. Prof. J. M. Woodburn Morison and Dr. J. F. Bromley will also speak.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Feb. 17th.—9 P.M., Dr. P. H. Manson-Bahr: The Differential Diagnosis of Diseases of the Colon (Dysentery and Colitis) and their Complications (first Lettsomian lecture).

CHELSEA CLINICAL SOCIETY.

TUESDAY, Feb. 18th.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Mr. Desmond MacManus and Mr. Cecil Rowntree: Consultations.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.

FRIDAY, Feb. 21st.—5 P.M., Dr. W. M. Ash: Prevention of River Pollution.

Maternity and Child Welfare Group.—8.30 P.M., Dr. Andrew Topping: Certain Factors Influencing Maternal Mortality and the Part Played in Combating them.

Tuberculosis and Dental Officers' Groups.—8 P.M., Discussion on Dental Treatment of Tuberculous Patients.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY, Feb. 20th.—8.15 P.M., Dr. R. Lewthwaite: Recent Work on the Typhus-like Fevers of Malaya.

TUBERCULOSIS ASSOCIATION.
FRIDAY, Feb. 21st.—5.15 P.M. (Manson House, 26, Portland-place, W.), Dr. H. H. Scott and Dr. C. H. C. Toussaint: Primary Tuberculosis in Children and its Relationship to Meningitis. 8.30 P.M., Sir Henry Gauvain and Mr. G. R. Girdlestone: The Treatment of Tuberculous Lesions of Bones and Joints.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Feb. 19th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. George Graham: Treatment of Diabetes.

SOCIETY OF RADIOTHERAPISTS.
FRIDAY, Feb. 21st.—4.30 P.M. (11, Chandos-street, W.), Mr. Geoffrey Keynes and Dr. W. M. Levitt: The Technique of Radiotherapy in Carcinoma of the Breast which has not been previously Treated.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, Feb. 17th, WEDNESDAY and FRIDAY.—5 P.M., Dr. John Beattie: Temperature Regulation (Arris and Gale lectures).

UNIVERSITY OF LONDON.
FRIDAY, Feb. 21st.—11 A.M. (London School of Hygiene, Keppel-street, W.C.), Dr. W. G. Savage: Food Poisoning.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 19th.—4 P.M., Mr. A. Clifford Morson: Fads and Fancies in the Treatment of Prostatic Obstruction.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, Feb. 18th.—5.30 P.M., Dr. T. F. Cotton: Mitral Disease and its Treatment.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, Feb. 19th.—2 P.M., Mr. James Crooks: Tonsils, Adenoids, and Accessory Air Sinuses. 3 P.M., Dr. A. Signy: Bacteriology of Tonsillitis.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 17th.—3.30 P.M., Dr. Kinnier Wilson: Some Heredo Familial Diseases (I.), Extra Pyramidal (II.).
TUESDAY.—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (IV.).
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Mr. Leslie Paton: Optic Atrophy.
FRIDAY.—3.30 P.M., Dr. Purdon Martin: Poliomyelitis.
Out-patient Clinic daily at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 17th.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 1.30 P.M., Gynæcological wards. 2 P.M., Surgical wards, gynæcological and eye clinics. 4.15 P.M., Mr. Green-Armytage: Sterility.
TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic.
WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Lecture on anæsthesia.
THURSDAY.—10 A.M., Neurological and gynæcological clinics. Noon, Fracture clinic. 2 P.M., Eye and genito-urinary clinics.
FRIDAY.—10 A.M., Skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.
SATURDAY.—10 A.M., Surgical and children's clinics, medical wards.
Operations, medical and surgical clinics daily at 2 P.M.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

ST. JOHN CLINIC, Ranelagh-road, S.W.
FRIDAY, Feb. 21st.—4.30 P.M., Mr. Martin Oldershaw: Some Chronic Causes of "Rheumatism" in Women.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Feb. 18th.—5 P.M., Dr. S. E. Dore: Pruritus, Prurigo, and Lichenification.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 17th, to SUNDAY, Feb. 23rd.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. All-day course in gynæcology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. R. Y. Paton: Deformities. Thurs., 8.30 P.M., Mr. David Patey: Liver, Spleen, and Pancreas.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C. Afternoon course in dermatology.—PRINCESS ELIZABETH OF YORK HOSPITAL, Shadwell, E. Sat. and Sun., course in children's diseases.
Courses are open only to members and associates of the fellowship.

LEEDS GENERAL INFIRMARY.
TUESDAY, Feb. 18th.—3.30 P.M., Mr. Pain: Common Foot Complaints in General Practice.

LEEDS PUBLIC DISPENSARY.
WEDNESDAY, Feb. 19th.—4 P.M., Dr. S. J. Hartfall: Influenza.

UNIVERSITY OF DURHAM.
SUNDAY, Feb. 23rd.—10.30 A.M. (Newcastle General Hospital), Mr. A. Logan: Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Feb. 19th.—4.15 P.M. (Royal Infirmary), Dr. J. Ferguson Smith: Some Infective Diseases of the Skin.

Appointments

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.) = Assistant Medical Officer, Grades I. and II.

SHEEHAN, J. P., M.D., M.R.C.P. Irel., A.M.O. (II.), Bethnal Green;
KIRMAN, B. H., M.B. Lond., A.M.O. (II.), Constance-road Institution;
YOUNG, R. M., M.D. Edin., A.M.O. (II.), Constance-road Institution;
RAMSAY, A. M., M.B. Aberd., A.M.O. (II.), Fulham;
JONES-DAVIES, T. E., M.R.C.S. Eng., A.M.O. (II.), Highgate;
DIMSON, S. B., M.D. Lond., D.T.M. & H., A.M.O. (II.), Highgate;
MCGREGOR, C. B., M.B. Glasg., D.P.H., High Wood Hospital for Children;
MATHESON, I. W., F.R.C.S. Eng., A.M.O. (II.), Mile End;
DICKIE, A. E., M.B. Glasg., A.M.O. (II.), Mile End;
SIMON, E. L., M.B. Lond., A.M.O. (II.), St. Charles';
FOX, R. W. S., M.B. Melb., A.M.O. (II.), St. Charles';
BOYLE, A. K., M.B. Glasg., A.M.O. (II.), St. George-in-the-East;
ROWLANDS, E. A., M.B. Melb., F.R.C.S. Eng., A.M.O. (I.), St. Mary, Islington;
MERSON, G. P., M.B. Aberd., A.M.O. (II.), St. Olave's;
LAWSON, W. S. G., M.B. Lond., A.M.O. (II.), St. Pancras;
TULLIDGE, G. M., M.B. Lond., D.T.M. & H., House Physician, High Wood Hospital for Children;
EVANS, W. G., M.B., D.P.H., House Physician, North-Western;
ORPWOOD, R. M. M. C., M.R.C.S. Eng., D.P.H., House Physician, Queen Mary's Hospital for Children;
PEARSON, H. E. S., M.B., M.R.C.P. Lond., A.M.O. (I.), St. Mary, Islington;
GREEN, R. D., M.B., M.R.C.P. Lond., A.M.O. (II.), St. Pancras;
FLATLEY, G. D., M.B. Belf., A.M.O. (I.), Mile End.

Certifying Surgeons under the Factory and Workshop Acts: Dr. W. F. MASON (Bradford (Cleckheaton) District, Yorks (West Riding)); Dr. R. MCC. PATERSON (Shepshed District, Leicestershire); Dr. R. L. UNSWORTH (Westhoughton District, Lancashire); and Dr. GAVIN BROWN, (Mochrum District, Wigtown).

Births, Marriages, and Deaths

BIRTHS

BARKER.—On Feb. 1st, at a nursing-home, the wife of Dr. A. N. Barker, Maidstone-road, N., of a son.
HOLMWOOD.—On Feb. 7th, at Aldermaston, Berks, the wife of L. S. Holmwood, M.R.C.S. Eng., of a son.
LEANING.—On Feb. 2nd, in Edinburgh, the wife of Capt. R. R. Leaning, R.A.M.C., of a daughter.
LEVI.—On Feb. 5th, at Woodchurch-road, N.W., the wife of David Levi, M.S. Lond., F.R.C.S. Eng., of Harley-street, W., of a daughter.
ORR.—On Jan. 25th, at Neyyoor, Travancore, India, the wife of Ian M. Orr, M.D. Glasg., F.R.C.S. Edin., of a son.
SHAW.—On Feb. 7th, at Welbeck-street, to Mary Michael Shaw, M.B., B.S., wife of C. C. Shaw, B.Arch., A.R.I.B.A.—a son.
SUTHERLAND.—On Jan. 31st, at Bath, the wife of Dr. Alister Sutherland, of a daughter.

MARRIAGES

GRIFFITHS—WRIGLEY.—On Feb. 1st, at the Congregational Church, Buxton, Griffith John Griffiths, B.Sc., M.B. Lond., of Colwyn Bay, to Nancy Bryceson Wrigley, elder daughter of Mr. W. F. Wrigley of Buxton.
STEVENSON—GLUCK.—On Feb. 1st, at London, John Black Stevenson, M.C., M.B. Glasg., of Sanderstead, Surrey, to Marie Gluck, daughter of the late I. Gluck, Esq., of London.

DEATHS

BALLANCE.—On Feb. 8th, at St. John's Wood Court, N.W., Sir Charles A. Ballance, K.C.M.G., M.S. Lond., F.R.C.S. Eng.
BOSWELL.—On Feb. 6th, at York-avenue, East Sheen, S.W., Alexander Boswell, M.D. Aberd., aged 82.
LEECH.—On Feb. 7th, 1936, Priestley Leech, M.D. Lond., F.R.C.S. Eng., the dearly loved husband of Emmie Milson Leech, in his 74th year. Was laid to rest in St. Paul's Churchyard, King Cross, Halifax, Feb. 10th, 1936.
MAITLAND.—On Feb. 6th, at Dudley, Vivian Gray Maitland, M.R.C.S. Eng., D.P.H. Dub., in his 58th year.
MILNER.—On Feb. 4th, in London, Major Arthur Edward Milner, M.R.C.S. Eng., late R.A.M.C., in his 68th year.
PINCHIN.—On Feb. 7th, at Gledhow-gardens, S.W., Arthur John Scott Pinchin, M.D., F.R.C.P. Lond., aged 59.
WILLIAMS.—On Feb. 7th, at Burry Port, Carmarthenshire, John Henry Williams, L.S.A. Lond., M.P., Carmarthenshire, Llanelly Division.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

FURNITURE FOR CONVALESCENCE

CONVALESCENT homes too often carry the hospital tradition into what should be a holiday atmosphere. At the new convalescent home for children, built under the Zachary Merton trust for the Royal Manchester Children's Hospital, the furniture has been specially designed by Heal's to please the imagination of the child returning to health. The beds are of iron, and run on strong wooden castors, but there their likeness to hospital beds ends, for the smooth half-moon of iron at the head and foot of each bed is coloured green with cellulose paint, and bears a fine large picture of a country flower—a different flower for each bed, painted by hand, not a single design transferred interminably. The cots are green, too, each again with its special flower, and both sides of the cot can be lowered smoothly with no crashing of hinges or damage to nurses' insteps. The beds are sprung with strong chain springs, impervious to bouncing, and in addition to a good hair mattress each child has a feather pillow and a pillow of feather and down. Over the beds are spread wool rugs designed in shades of green, and at every bedside is a cupboard of weathered oak with a towel rail and a green top of cork and rubber composition on which the evening milk can be spilt and not one tear need be shed about it. The dining tables and play tables of strong and simple pattern have the same perdurable surface, but in a colour in harmony with the weathered oak of which all the furniture is constructed. The sturdy chairs are in two sizes, for longer and shorter patients. In the day-rooms the large toy cupboards have half-moons of wood for handles and roomy shelves. The book-cases are low and stout so that they can be climbed upon without damage to themselves and fallen off without damage to the climber. Sun couches with adjustable backs, wheel-chairs, and glass cupboards and trolleys for surgical equipment are the only things which recall the hospital a little; but even the ironwork of the cupboard is painted green. The comfort of the nurses has been equally considered. Their box-spring beds have a little bookshelf in the oak headpiece and a concealed light under its upper border. Such furniture as this has a look of summer even on a February day, and fully carries out the determination of Messrs. Heal and Son to avoid the hospital atmosphere. It is on view at their show-rooms in Tottenham Court-road, London, until Feb. 21st.

CHEST RADIOGRAPHY

A YEAR ago Messrs. Watson and Sons, Ltd., invited inspection of a new condenser set for radiography of the chest. One of these sets, installed on approval in a London hospital, has taken about 12,000 radiograms with little trouble and much efficiency. The principle of the condenser discharge is not new but has been revived in this set owing to the large current that can now be passed through a Rotalix tube for a thirtieth of a second without damage to the focus. The set is shock proof, the mechanical parts and tube being totally enclosed in a metal cabinet. It takes up 6 ft. 5 in. by 2 ft. 11 in. by 9 ft. 2 in. high. The advantages of this type of construction are briefly: (1) it is simple in operation; (2) variation in film density is controlled solely by variation of kilo voltage; (3) no time switch is required; (4) patients, no matter of what size, can be radiographed in the same exposure time of 1/30 sec.; (5) the level of the tube from the floor is fixed, the patient being centred by raising or lowering a platform electrically.

The quality of the radiographic detail is of a high order, showing a "soft" picture with a wealth of detail. Nine variations of penetration are provided, a "tail" being provided which gives a slightly increased exposure time per stud. In practice it is found that studs Nos. 1 and 2 are of no value. No. 3 has been used for children, 4, 5, and 6 for normal adults according to their thickness, studs 7, 8, and 9 only being required for stout patients. Anterior views are taken at a distance of 5 ft., since at this distance the machine gives the requisite blackening in a patient of average build. The hope of obtaining views of comparable density in radiograms of the same subject taken at intervals was not realised, although it would be unfair to attribute such difference as arises to the set itself when other factors are present such as alteration in weight of the patient, change in dark-room technique, or screen speed.

Certain disadvantages have been noticed in practice: (1) The limited number of available variations of penetration, the lower studs being too low for present-day screen speed; the gaps between successive studs represent a change of 5 k.v. per stud. (2) The 5 ft. distance at which the radiograms are taken is a non-standard distance; a disadvantage in cardiac work. (3) The exposure factors are only sufficient to produce a lateral radiogram of the chest at a distance of 3 ft. in a patient of small build. (4) Patients cannot be X rayed in the erect position unless able to stand; many would be steadier and more comfortable in the sitting position. (5) The set cannot be used for stereoscopic work.

The manufacturers deserve credit for having produced so serviceable a plant, and no doubt in future models they will meet some at least of these difficulties. Many patients are able to sit up to be radiographed at a time when they are unable to stand. With more variations of penetration and smaller gaps between them it should become practicable to adjust penetration more exactly to the patient's thickness. It seems likely that the problem of obtaining penetrating views and lateral radiograms will be solved more easily when faster films or intensifying screens are available.

SMALL BOOKS ON GREAT MATTERS

THREE more of Cassell's "Health Handbooks," under the general editorship of Dr. A. D. Baker, have recently been published at 1s. each. The first, by Dr. G. J. V. Crosby, is concerned with "Insomnia and Disordered Sleep," the causes of which are classified as physical, psychical and mixed. Certain obvious extraneous causes such as noise or cold feet account for still another group. Among the physical causes the author rightly places high blood pressure; he calls this a disease of modern civilisation and large communities, whereas it is common enough among unhurried persons in rural areas. He also revives the bogy of auto-intoxication from a loaded bowel, an injudicious resurrection with which to confront an already purgative-ridden generation. Somewhat sweepingly he asserts that intoxication by the poisons of typhoid, acute fevers, syphilis, lead, and tobacco, if untreated, lead to hardening of the arteries. Though sound on the sleep requirements of children he perhaps exaggerates the significance of "the mysterious and frightening manifestations of puberty" which are surely nowadays for the most part properly dealt with. There is a short chapter on somnambulism and nightmares and appended to each chapter is a summary of conclusions.

In these days of infant welfare clinics the feeding and management of babies have been so thoroughly worked out that they are no longer very disputatious matters. "Healthy Babies," by the Hon. Mrs. Noel Olivier Richards, M.D., is a simple, authoritative, and practical little book with which it is difficult to find fault. Not everyone will endorse the view that weaning may be postponed till the twelfth month or even later. Prolonged suckling is undoubtedly a strain on some otherwise healthy women. The author advocates that when the baby is put to sleep out of doors it should lie in a secluded place free from interruption "by visitors

and out of reach of dustbins, brooms, drains, or kitchens or the dust from the road." Cats might have been added to the list. Dr. Richards takes the sensible view that masturbation in the young child should be ignored and that the tendency to examine and explore should not be discouraged. Perhaps, however, she over-emphasises the need to protect the small child from physical dangers. Any parent who has watched his or her offspring clambering upstairs or climbing into a high-chair will have been struck with the degree of native caution it displays if left to itself.

The third volume, entitled "Birth Control," is contributed by Dr. Helena Wright, and might well have been confined to practical matters, whereas it contains much propaganda in it. Some of the statements made seem over-dogmatic; for instance, that "there is no way of conducting a reasonable happy married life without a method of controlling the number of children," and again "the cap and chemical take about two minutes to place in position . . . and no harm results to the woman concerned if this technique is used every night for an indefinite numbers of years." On both of these points, picked at random from the book, it would seem impossible to make such a definite pronouncement at the present time. In her discussion of the problems of limiting the size of families Dr. Wright makes no mention or allowance for the rapid decline in natural fertility which is apparently occurring in the Western races. Although there will not be universal agreement among doctors that the best techniques have been here described, the book has undoubted merit. It is written in concise and simple style and its arguments and the descriptions of such methods of birth control as are advocated by the author are easy to follow.

A NEW FORM OF MERCURY ARC

THE mercury arc as we know it to-day has altered little since the early discoveries of Arons, Cooper Hewitt, Kuch, and others. The "atmospheric" type of burner made it unnecessary to tilt the tube, to strike the arc by applying external heat, but the mercury lamp still remained as a discharge between two massive pools of mercury. A new type of arc has recently been placed on the market by Messrs. Hanovia Ltd., which employs a new system of starting, though the final quality of output remains unchanged. This burner is based on the recent work of Spanner, and consists of a simple quartz tube containing a very little mercury, a certain amount of the rare gas argon, and is fitted with special electrodes of "activated" metal. When switched on, a spark discharge is established which rapidly heats up the electrodes until they are emitting electrons in the same way as the filament of a thermionic valve generates electrons. As the temperature rises the mercury is volatilised and the spark discharge passes into the normal mercury arc.

The new burner does not require tipping to start it and will burn in any position. It has other advantages over the standard type. Owing to the absence of the heavy reservoirs of mercury the tube is far less fragile and can be sent by post if well packed. The time taken for the establishment of full output is considerably less than with the standard type, probably because of the smaller quantity of heat needed. The new arc can run equally well on alternating and direct current, and since the alternating supply is becoming universal this is of great importance. The old form of three-electrode tube for A.C. never proved as satisfactory as the D.C. type.

As regards output a 15 per cent. increase is claimed on a reduced current. The quartz of the tube suffers the same progressive deterioration as has been observed in all other mercury arcs, but a new compensating rheostat has been incorporated by which the current can be pushed up after the burner has been in use for a certain number of hours.

It will be found that these advantages are reflected in the price, but the manufacturers are offering special terms for replacement of old burners.

THE GLAXO LABORATORIES

THE transfer, from cramped and adapted town premises to a spacious semi-rural site, of a manufacturing concern based on scientific control is a vast undertaking. The Glaxo company is to be congratulated on the successful way in which they have done this. A site of 15 acres at Greenford—that classic spot where Perkin discovered the first aniline dye—has given opportunity for considered and ordered design, an opportunity which has not been lost.

A long well-lighted very modern building with only one floor above ground level is arranged so that raw materials brought in at one bay, adapted for easy unloading of lorries, pass through the various processes in their way across the factory part of the building to a dispatch bay, without confusion or unnecessary handling. In some cases raw material is brought to the upper floor so that it may be ground, sieved, mixed with other products or otherwise treated; so the final preparation then gravitates to the lower level where it is divided into appropriate measured or weighed units and put in suitable containers for sale and use. All this necessary preparation is done with the minimum of effort and with proper regard to cleanliness, but without the eyewash of redundant precautions designed to make an impression on visitors.

The substances prepared at Greenford include vitamins A, B_1, B_2, C, and D, parathyroid extract, the œstrogenic hormone, ergot alkaloids, pituitary extract, and antiviruses and similar bodies; many of them are sent out in admixture with suitable food products or mineral constituents which may be deficient in the human body and form useful adjuncts to the organic preparations. Milk and malt products and cod-liver oil of guaranteed potency are also handled at Greenford. Most of the products mentioned can only be offered with confidence to medical men and their patients if their activity and composition can be guaranteed as suitable and reasonably constant in batches made or sold at different times. The greater part of the upper floor of the Greenford laboratories is therefore devoted to control and research.

The chemical laboratory consists of one large room where research and analytical control goes on side by side. This arrangement which, although not usual, is followed in some other large laboratories, such as those at County Hall, has the advantage of enabling the scientific staff to survey the whole of the work and ensures the pooling of knowledge, experience, and initiative, besides easing the dislocation caused by sickness or holidays. Chemical control is supplemented by physical examination where this is of service, as, for example, in the spectrometric assay of vitamin A.

Chemical or physical examination suffices for some purposes and in others enables batches of material to be packed ready for issue, but where the question of activity is important, as in the case of vitamins, actual issue is delayed until experiments on animals have shown that the preparation is up to standard. For this purpose a large animal department is kept up, in which thousands of white rats of the well-known Wistar strain are bred and stored, both for sale to research workers and for experiments in the laboratory itself. Besides the laboratories mentioned others are devoted to bacteriology and the preparation of vaccines.

The occupation of the new laboratories was carried out very carefully; an illustrated pamphlet was distributed among the workers before the move was effected, and everyone could see from it where he would be working and how to get there, besides finding his way to any part of the building which might concern him. When a visit was paid to Greenford, a

few weeks after the move, everyone seemed as "native and to the manner born"; the obvious newness of the building and some plant erection which was going on were the only signs that the place had not been running smoothly for years.

SPECIMENS IN THE POST

FEW parcels can be more unpleasant, if not dangerous, in the post than material badly packed and sent for pathological examination. To prevent the risk of infecting Post Office servants and of contaminating the mails, the Postmaster-General has drawn attention—he says he has reason for doing so—to the conditions for sending specimens. The material must be in a hermetically sealed or securely closed container, placed in a strong case with enough absorbent packing to prevent movement and any possible leakage. It must be clearly labelled "Pathological specimen. Fragile, with care," and sent only by letter post. If a packet fails to conform to these regulations it is at once destroyed with all its wrappings and enclosures, and the sender is liable to prosecution.

A DISCLAIMER

DRS. David and Robert Thomson write to disclaim responsibility for the publicity given to an article which they and Mr. E. T. Thompson recently wrote on giving vaccine by mouth. "The lay press's interest in colds and influenza," they say, "is so great that it is almost dangerous now for a doctor to publish an article on the subject except in some obscure medical journal."

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S. At rate of £100.

Archway Hospital, Archway-road, N.—Asst. M.O. £250.

Bangor, Caernarvonshire and Anglesey Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.

Bath and Wessex Children's Orthopædic Hospital, Combe Park.—H.S. At rate of £120.

Birmingham, Queen's Hospital.—Sen. Res. Anæsthetist. At rate of £70–£100.

Birmingham, Romsley Hill Sanatorium.—Res. Asst. M.O. At rate of £240.

Birmingham, St. Chad's Hospital.—Jun. Res. M.O. At rate of £150.

Blackburn, Queen's Park Hospital and Institution.—Res. Jun. Asst. M.O. At rate of £150.

Bolton Royal Infirmary.—Res. Surg. O. £250.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £150.

Brighton, Royal Sussex County Hospital.—Second Asst. Pathologist. £450.

British Postgraduate Medical School, Ducane-road, W.—Two First Assts. for Dept. of Surgery. Each £250–£500.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cancer Hospital, Fulham-road, S.W.—Res. M.O. for Radium Dept. At rate of £100.

Carlisle, Cumberland Infirmary.—Second H.S. At rate of £155.

Central London Ophthalmic Hospital, Judd-street, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Chelsea Hospital for Women, Arthur-street, S.W.—Registrar (Gynæcological) and Radium Officer. £75.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Laryngologist.

Constance-road Institution, East Dulwich, S.E.—Asst. M.O. £250.

Coventry and Warwickshire Hospital.—Res. Cas. O. £125.

Eastbourne, Princess Alice Memorial Hospital.—Hon. Anæsthetist.

Egyptian Government.—Director of Lunacy Division in P.H. Dept. L.E. 1020 to L.E. 1200.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.

Forest Gate Hospital, Forest-lane, E.—First Asst. Res. M.O. £525. Also Second Asst. Res. M.O. £350.

Gloucestershire Royal Infirmary, &c.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Halifax Royal Infirmary.—Third H.S. At rate of £150.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.

Hertford, Ware Park Sanatorium.—Asst. M.O. £300.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Surg. Reg. £100. Also Clin. Asst. to Ear, Nose, and Throat Dept.

Hull Royal Infirmary.—First H.S. £150.

Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £144.

Ipswich Mental Hospital.—H.P. £150.

Kingston upon Hull City and County.—Asst. M.O.H. £600.

Leicester County Sanatorium and Isolation Hospital, Markfield.—Jun. Res. M.O. At rate of £300.

Lewisham Hospital, High-street, S.E.—Asst. M.O. £350. Also Asst. M.O. £250.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, Bootle General Hospital.—H.P. and H.S. Each at rate of £150.

London Fever Hospital, Liverpool-road, N.—Anæsthetist.

Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.

Manchester, Duchess of York Hospital.—Sen. Res. M.O. At rate of £125.

Manchester Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s for Out-patients' Dept. Each at rate of £150.

Manor House Hospital, Golders Green, N.W.—Jun. M.O. £200.

Metropolitan Hospital, E.—Hon. Surgeon. Also Surg. Reg.

Middlesex County Council.—Tuber. M.O. £750. Tuberculosis Sanatorium, South Mimms. Deputy Med. Supt., &c. £450.

Middlesex Hospital, W.—Anæsthetist. Also Asst. Anæsthetist. £100.

Miller General Hospital, Greenwich-road, S.E.—Cas. O., Out-patient Officer. Each at rate of £150. Also H.P. & H.S. Each at rate of £100.

Mount Vernon Hospital, Northwood.—H.S. At rate of £150.

National Hospital, Queen-square, W.C.—Res. M.O. £200.

Nelson Hospital, Merton, S.W.—Two Res. H.S.'s. Each at rate of £100.

New End Hospital, Hampstead, N.W.—Asst. M.O. £250.

Nottingham General Hospital.—H.S. for Fracture and Orthopædic Depts. £300. Also H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. and H.P. Each at rate of £120.

Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £200.

Prince of Wales's General Hospital, N.—Res. Jun. H.P.'s and H.S.'s. Each at rate of £90. Also Hon. Med. and Surg. Regs. Each £100.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Rochdale Infirmary and Dispensary.—Second H.S. £150.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. £150.

Royal Naval Medical Service.—Eight vacancies.

St. Andrew's Hospital, Devons-road, E.—Asst. M.O. £250.

St. Bartholomew's Hospital Medical College.—Sen. Demonstrator in Dept. of Pathology. £400.

St. George's Hospital, S.W.—Asst. Bacteriologist. £500.

St. Leonard's Hospital, Hoxton-street, N.—Asst. M.O. £250.

St. Luke's Hospital, Sydney-street, S.W.—Asst. M.O. £250.

Salford Royal Hospital.—Hon. Asst. Gynæcologist.

Salisbury General Infirmary.—H.S. At rate of £125.

Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.

South Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £100.

South London Hospital for Women, Clapham Common, S.W.—H.P. At rate of £100.

Stoke-on-Trent, North Staffordshire Infirmary.—Radium Officer. £500.

Swansea County Borough.—Asst. M.O. £500.

Tancred's Studentships.—Three. Each £100.

University College Hospital, Gower-street, W.C.—Bilton Pollard Fellowship. £650.

Warrington County Mental Hospital, Winwick.—Asst. M.O. £500.

Warwickshire County Council.—Asst. County M.O.H. £500.

Westminster Hospital, Broad Sanctuary, S.W.—Obstet. Tutor and Reg. £100.

West Riding of Yorkshire, Middleton-in-Wharfedale Sanatorium.—Res. Asst. M.O. £350.

Whitechapel Venereal Diseases Clinic, Turner-street, E.—Director. £1250.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Rhondda (Porth) (Glamorgan), Cowbridge (Glamorgan), and Larkhall (Lanark).

ROYAL HALIFAX INFIRMARY.—Increased funds are needed at this hospital if the standard of efficiency is to be maintained. During the year 22,372 patients were treated, an increase of 1603 on the previous year, and the average cost of each in-patient was £6 8*s.* 4*d.* Workpeoples' contributions for the first time exceeded £10,000, and the paying patients' ward produced £4750.

INDEX TO "THE LANCET," VOL. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.